



# Test Report

Product Name : HSPA/ Wi-Fi Module

Model No. : EM772

FCC ID : QISEM772

Applicant : Huawei Technologies Co., Ltd.

Address : Administration Building, Huawei Base, Bantian,  
Longgang District, Shenzhen 518129 P.R.C.

Date of Receipt : 2009/05/12

Issued Date : 2009/06/26

Report No. : 095S084R-RF-US-P05V01

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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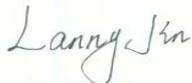
## Test Report Certification

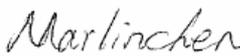
Issued Date : 2009/06/26

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Product Name : HSPA/ Wi-Fi Module  
Applicant : Huawei Technologies Co., Ltd.  
Address : Administration Building, Huawei Base, Bantian,  
Longgang District, Shenzhen 518129 P.R.C.  
Manufacturer : Huawei Technologies Co., Ltd.  
Model No. : EM772  
FCC ID : QISEM772  
Rated Voltage : AC 120 V / 60 Hz  
EUT Voltage : DC 3.3V  
Trade Name : HUAWEI  
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2008  
ANSI C63.4: 2003  
Test Result : Complied  
Performed Location : SuZhou EMC laboratory  
No.99 Hongye Rd., Suzhou Industrial Park Loufeng  
Hi-Tech Development Zone., SuZhou, China  
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098  
FCC Registration Number: 800392

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## Laboratory Information

We , **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited by the following accreditation Bodies in compliance with ISO 17025, EN 45001 and Guide 25:

<b>Taiwan R.O.C.</b>	<b>: BSMI, DGT, CNLA</b>
<b>Germany</b>	<b>: TUV Rheinland</b>
<b>Norway</b>	<b>: Nemko, DNV</b>
<b>USA</b>	<b>: FCC, NVLAP</b>
<b>Japan</b>	<b>: VCCI</b>

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://tw.quietek.com/modules/myalbum/>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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## 1. General Information

### 1.1. EUT Description

Product Name	HSPA/ Wi-Fi Module
Trade Name	HUAWEI
Model No.	EM772
Working Voltage	DC 3.3V
Frequency Range	802.11b/g/n(20MHz): 2412 ~ 2462 MHz 802.11n(40MHz): 2422 ~ 2452 MHz
Channel Number	802.11b/g/n(20MHz): 11 802.11n(40MHz): 7
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM
Data Rate	802.11b: 1/2/5.5/11 Mbps 802.11g: 6/9/12/18/24/36/48/54 Mbps 802.11n: up to 135Mbps
Channel Control	Auto
Antenna Delivery	1*TX + 2*RX
Antenna Type	PIFA
Antenna Gain	2dBi

802.11b/g/n(20MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz	04	2427 MHz
05	2432 MHz	06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz	N/A	N/A

802.11n(40MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz	N/A	N/A

**1.2. Mode of Operation**

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit by 802.11b
Mode 2: Transmit by 802.11g
Mode 3: Transmit at 802.11n (20MHz)
Mode 4: Transmit at 802.11n (40MHz)

Note:

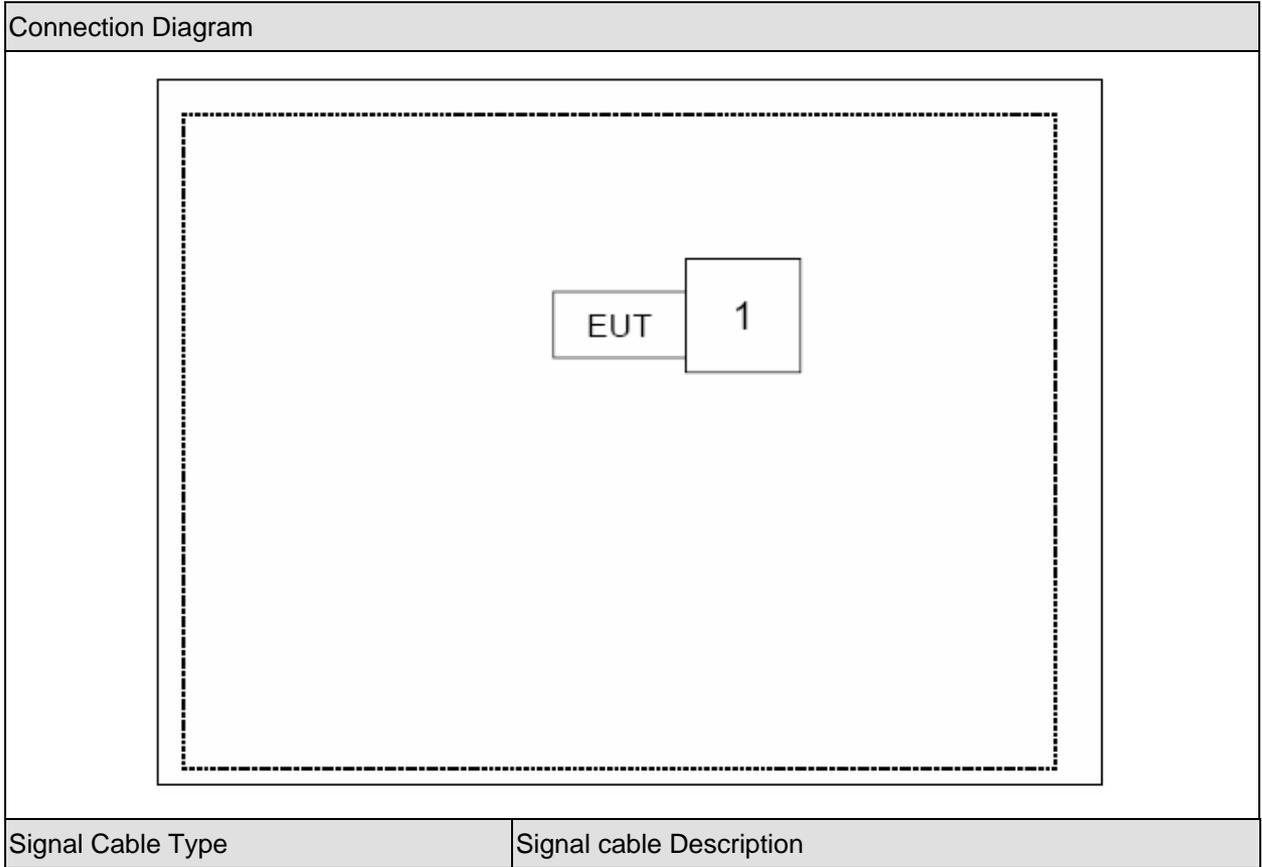
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. This device is a composite device in accordance with Part 15 Subpart B regulations. The function for the receiver was measured and made a test report that the report number is 095S084R-IT-US-P01V02.

**1.3. Tested System Details**

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	DELL	PP19L	JH097 A01	Power by adapter

### 1.4. Configuration of Tested System



**1.5. EUT Exercise Software**

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Execute "ART" test program on the PC.
4	Select the test channel and the test mode, ant then press ok to start continue transmit or receive.

## 2. Technical Test

### 2.1. Summary of Test Result

- No deviations from the test standards  
 Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.209	Yes	No
RF Antenna Conducted Spurious	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2008 15.247(d)	Yes	No
Operation Frequency Range of 20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2008 15.215(c)	Yes	No
Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(a)(2)	Yes	No
Power Output	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(b)(3)	Yes	No
Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(e)	Yes	No

**2.2. Test Environment**

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	51
Barometric pressure (mbar)	860-1060	950-1000

### 3. Conducted Emission

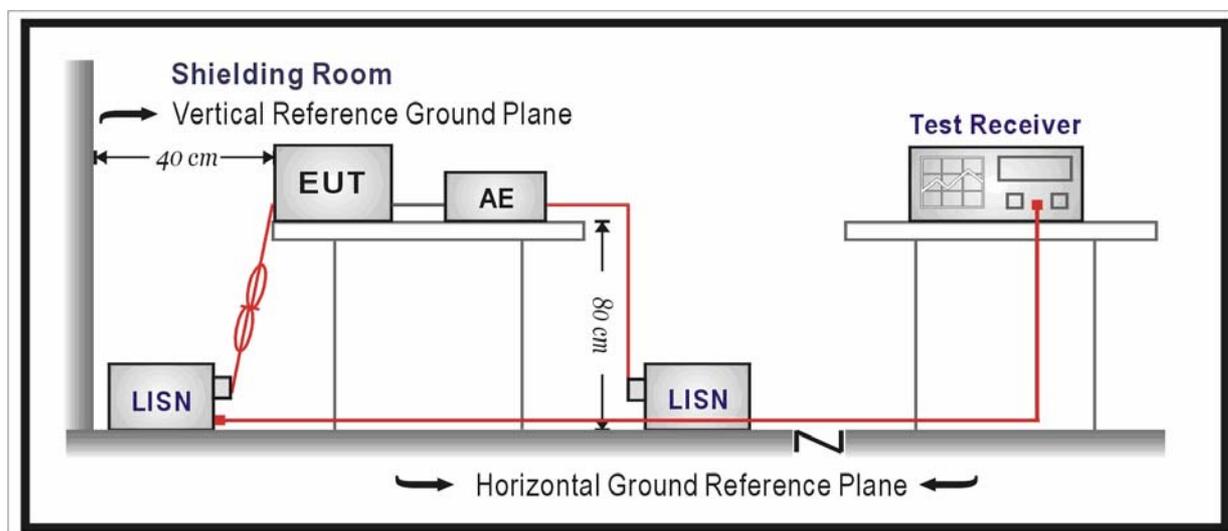
#### 3.1. Test Equipment

Conducted Emission / SR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100726	2009/04/23
Two-Line V-Network	R&S	ENV216	100013	2009/06/11
Two-Line V-Network	R&S	ENV216	100014	2009/04/23
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2008/11/24
50ohm Termination	SHX	TF2	07081401	2008/09/28
Coaxial Cable	Luthi	RG214	519358	2009/05/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH004	2009/03/31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

#### 3.2. Test Setup



**3.3. Limit**

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

**3.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

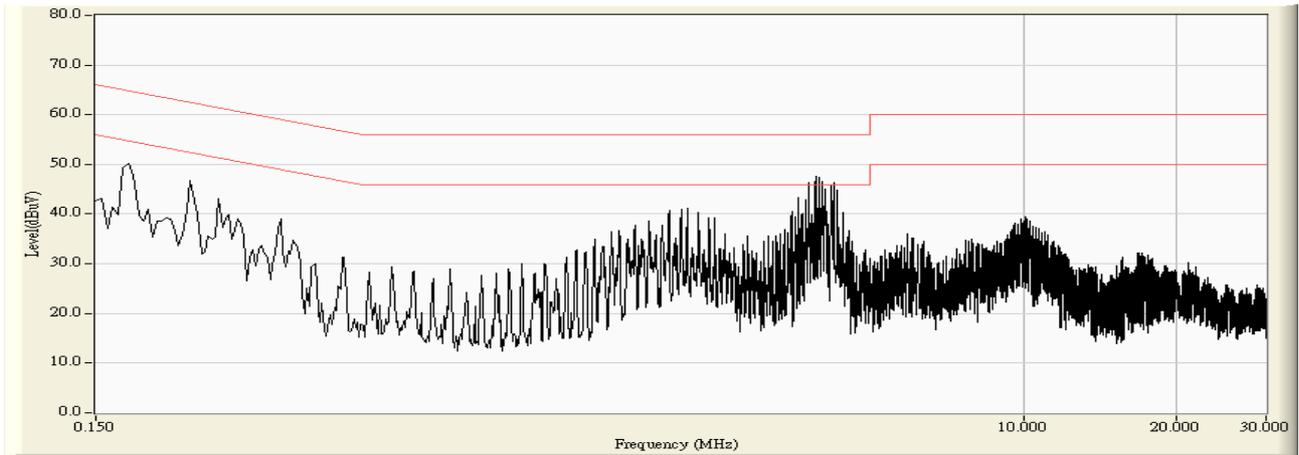
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

**3.5. Uncertainty**

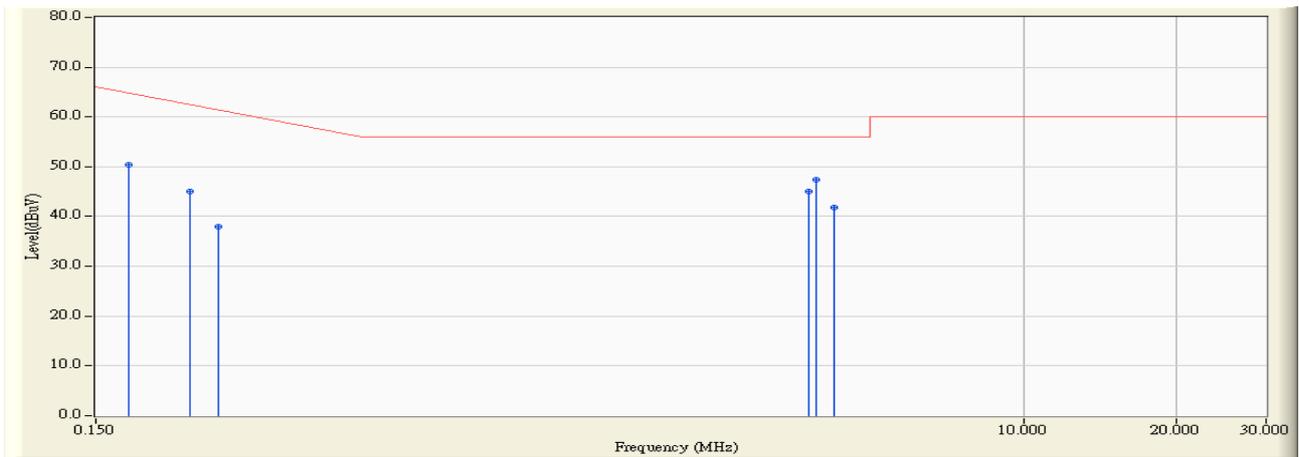
The measurement uncertainty is defined as  $\pm 2.02$  dB

**3.6. Test Result**

Engineer : Robin	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2009/06/09 - 10:49
Limit : FCC_SPartC_15.207_00M_QP	Margin : 10
EUT : HSPA/ Wi-Fi Module	Probe : ENV216_100014(0.009-30MHz) - Line1
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b



Engineer : Robin	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2009/06/09 - 10:51
Limit : FCC_SPartC_15.207_00M_QP	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : ENV216_100014(0.009-30MHz) - Line1
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b

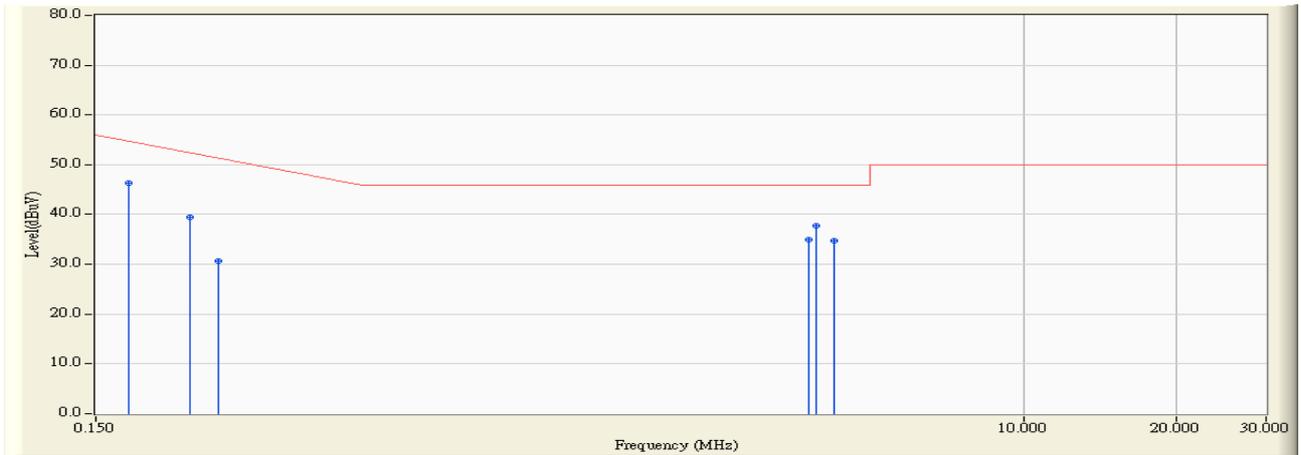


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.174	9.929	40.400	50.329	-14.985	65.314	QUASIPeAK
2		0.230	9.447	35.500	44.947	-18.767	63.714	QUASIPeAK
3		0.262	9.469	28.600	38.069	-24.731	62.800	QUASIPeAK
4		3.786	9.819	35.200	45.019	-10.981	56.000	QUASIPeAK
5	*	3.902	9.820	37.600	47.420	-8.580	56.000	QUASIPeAK
6		4.250	9.844	32.000	41.844	-14.156	56.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

<b>Engineer : Robin</b>	
<b>Site : SR-1 (Conducted Emission and Power Disturbance Test)</b>	<b>Time : 2009/06/09 - 10:51</b>
<b>Limit : FCC_SPartC_15.207_00M_AV</b>	<b>Margin : 0</b>
<b>EUT : HSPA/ Wi-Fi Module</b>	<b>Probe : ENV216_100014(0.009-30MHz) - Line1</b>
<b>Power : AC 120V/60Hz</b>	<b>Note : Mode 1: Transmit by 802.11b</b>

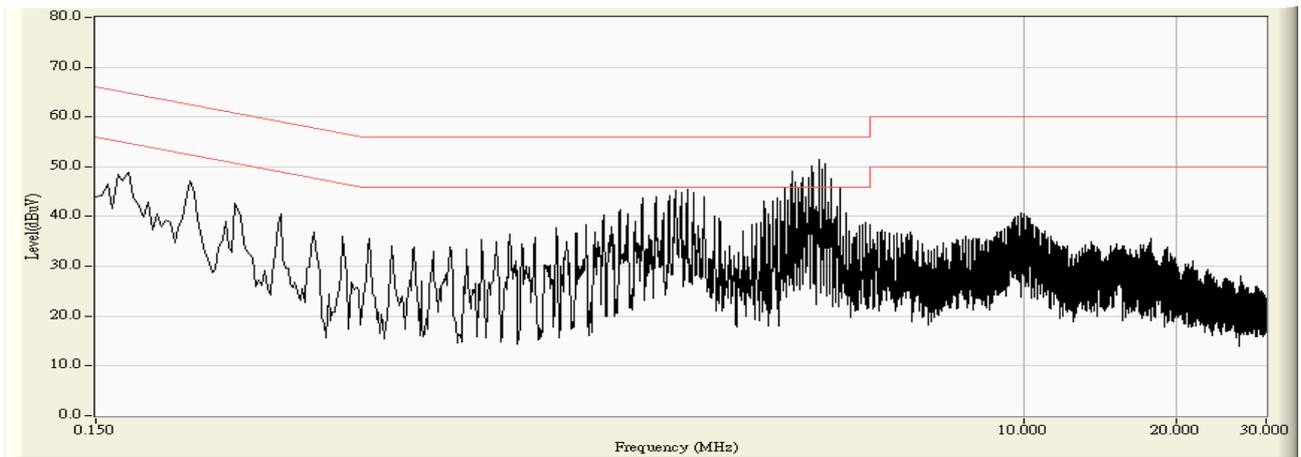


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.174	9.929	36.400	46.329	-8.985	55.314	AVERAGE
2		0.230	9.447	30.000	39.447	-14.267	53.714	AVERAGE
3		0.262	9.469	21.300	30.769	-22.031	52.800	AVERAGE
4		3.786	9.819	25.100	34.919	-11.081	46.000	AVERAGE
5	*	3.902	9.820	28.000	37.820	-8.180	46.000	AVERAGE
6		4.250	9.844	24.800	34.644	-11.356	46.000	AVERAGE

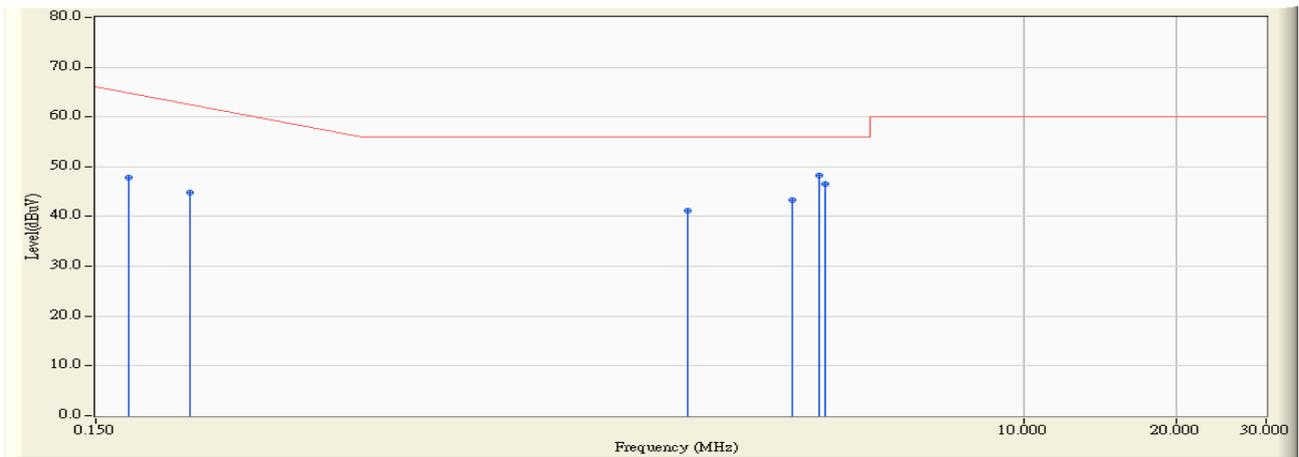
**Note:**

1. All Reading Levels are Quasi-Peak and average value.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Robin	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2009/06/09 - 10:53
Limit : FCC_SPartC_15.207_00M_QP	Margin : 10
EUT : HSPA/ Wi-Fi Module	Probe : ENV216_100014(0.009-30MHz) - Line2
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b



<b>Engineer : Robin</b>	
<b>Site : SR-1 (Conducted Emission and Power Disturbance Test)</b>	<b>Time : 2009/06/09 - 10:56</b>
<b>Limit : FCC_SPartC_15.207_00M_QP</b>	<b>Margin : 0</b>
<b>EUT : HSPA/ Wi-Fi Module</b>	<b>Probe : ENV216_100014(0.009-30MHz) - Line2</b>
<b>Power : AC 120V/60Hz</b>	<b>Note : Mode 1: Transmit by 802.11b</b>

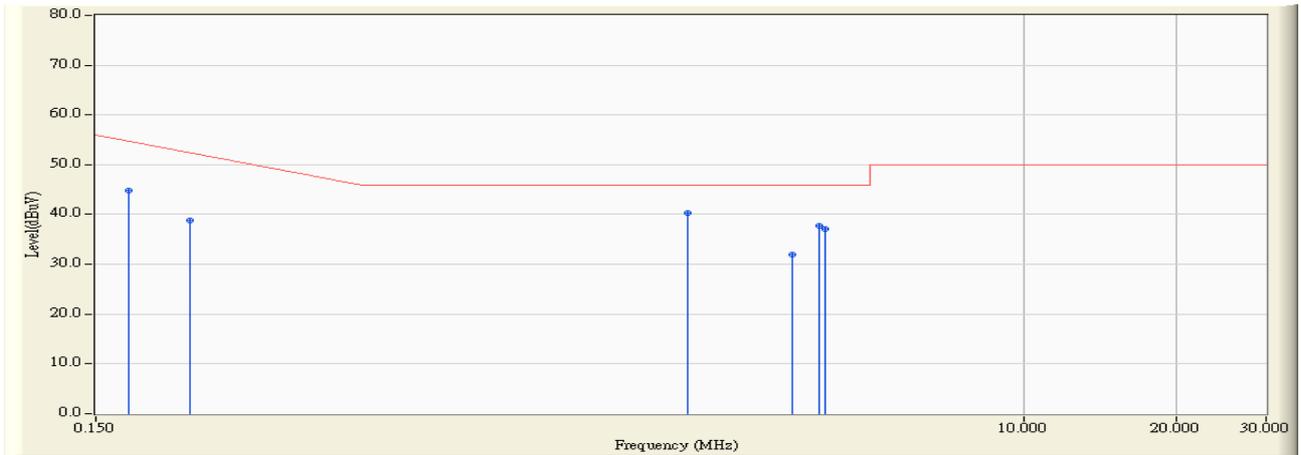


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.174	9.864	37.900	47.764	-17.550	65.314	QUASIPeAK
2		0.230	9.580	35.200	44.780	-18.934	63.714	QUASIPeAK
3		2.182	9.660	31.500	41.160	-14.840	56.000	QUASIPeAK
4		3.502	9.705	33.700	43.405	-12.595	56.000	QUASIPeAK
5	*	3.966	9.720	38.600	48.320	-7.680	56.000	QUASIPeAK
6		4.078	9.720	36.800	46.520	-9.480	56.000	QUASIPeAK

**Note:**

1. All Reading Levels are Quasi-Peak and average value.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

<b>Engineer : Robin</b>	
<b>Site : SR-1 (Conducted Emission and Power Disturbance Test)</b>	<b>Time : 2009/06/09 - 10:56</b>
<b>Limit : FCC_SPartC_15.207_00M_AV</b>	<b>Margin : 0</b>
<b>EUT : HSPA/ Wi-Fi Module</b>	<b>Probe : ENV216_100014(0.009-30MHz) - Line2</b>
<b>Power : AC 120V/60Hz</b>	<b>Note : Mode 1: Transmit by 802.11b</b>



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	0.174	9.864	34.900	44.764	-10.550	55.314	AVERAGE
2	0.230	9.580	29.300	38.880	-14.834	53.714	AVERAGE
3	* 2.182	9.660	30.600	40.260	-5.740	46.000	AVERAGE
4	3.502	9.705	22.200	31.905	-14.095	46.000	AVERAGE
5	3.966	9.720	28.000	37.720	-8.280	46.000	AVERAGE
6	4.078	9.720	27.400	37.120	-8.880	46.000	AVERAGE

**Note:**

1. All Reading Levels are Quasi-Peak and average value.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

## 4. Radiated Emission

### 4.1. Test Equipment

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2008/11/12
EMI Test Receiver	R&S	ESCI	100573	2009/04/23
Preamplifier	Quietek	AP-180C	CHM-0602012	2008/11/24
Bilog Type Antenna	Schaffner	CBL6112B	2932	2009/02/25
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2009/06/11
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2009/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375 /2510-60/11SS	SN9	2009/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2009/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2009/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200447304	2008/11/24
Coaxial Cable	Huber+Suhner	AC2-C	04	2009/05/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2009/03/31

Radiated Emission / AC-3

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2009/04/23
EMI Test Receiver	R&S	ESCI	100176	2008/11/15
Preamplifier	Quietek	AP-180C	CHM-0602012	2009/05/05
Bilog Type Antenna	Schaffner	CBL6112D	22254	2009/02/25
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2009/06/11
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2009/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375 /2510-60/11SS	SN9	2009/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2009/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2009/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2008/11/24
Coaxial Cable	Huber+Suhner	AC2-C	05	2009/05/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2009/03/31

☒ Radiated Emission / AC-5

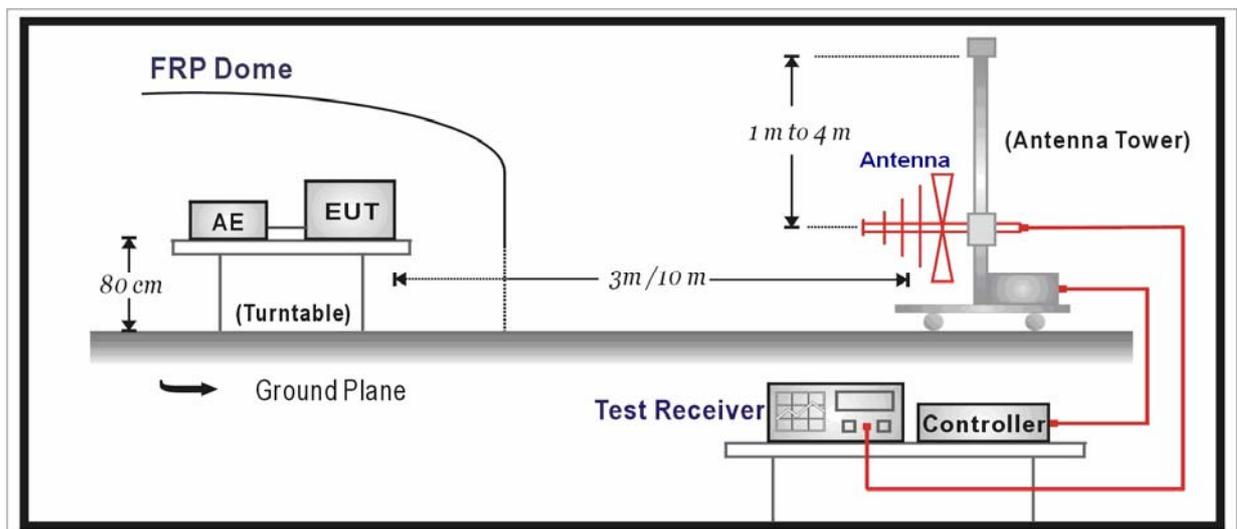
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2009/04/23
EMI Test Receiver	R&S	ESCI	100906	2009/02/16
Preamplifier	Quietek	AP-180C	CHM-0602013	2009/05/25
Bilog Type Antenna	Teseq GmbH	CBL6112D	27612	2009.02.25
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2009.06.11
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2009/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375 /2510-60/11SS	SN9	2009/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2009/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2009/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2008/11/24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC5-TH	2009.03.31

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

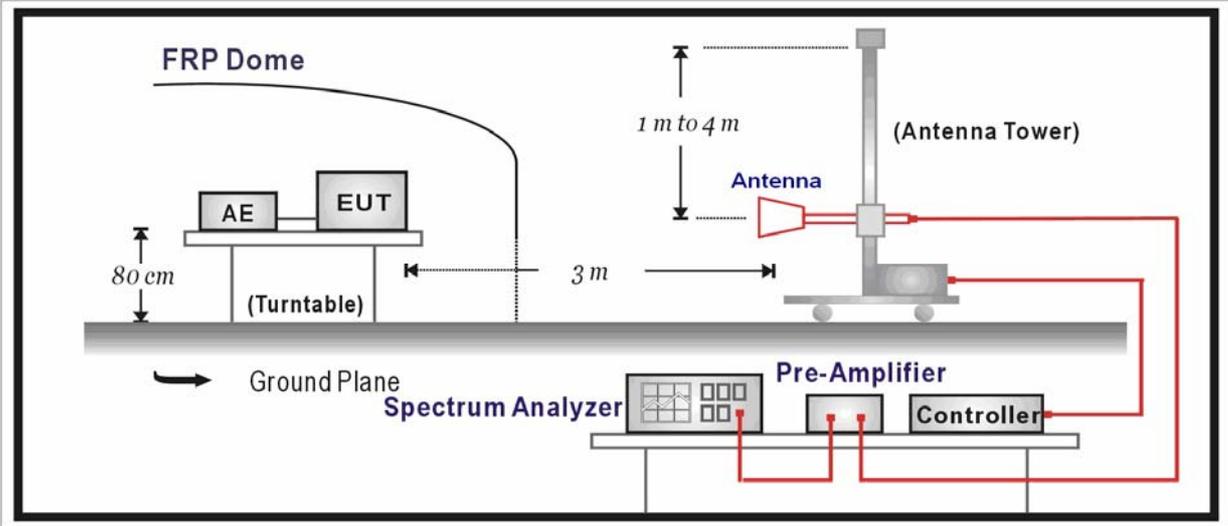
Note 2: The test instruments marked with "X" are used to measure the final test results.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



**4.3. Limit**

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

**4.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When measurement above 1GHz, the horn antenna will bend down a little (as horn antenna have the narrow beamwidth) in order to find the maximum emission of EUT.

**4.5. Uncertainty**

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

4.6. Test Result

802.11b

Channel	Frequency Range (MHz)	Measure Level (dBuV/m)	Detector Type	Limit (dBuV/m)
1	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
6	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
11	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)

Note 1: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

802.11g

Channel	Frequency Range (MHz)	Measure Level (dBuV/m)	Detector Type	Limit (dBuV/m)
1	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
6	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
11	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)

Note 1: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

802.11n (20MHz)

Channel	Frequency Range (MHz)	Measure Level (dBuV/m)	Detector Type	Limit (dBuV/m)
1	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
6	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
11	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)

Note 1: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

802.11n (40MHz)

Channel	Frequency Range (MHz)	Measure Level (dBuV/m)	Detector Type	Limit (dBuV/m)
1	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
6	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)
11	30~88	≤25	QP	40
	88~216	≤28	QP	43.5
	216~960	≤30	QP	46
	960~1000	≤32	QP	54
	1000~25000	≤48	PK	54 (Note 1)

Note 1: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

## 5. RF Antenna Conducted Spurious

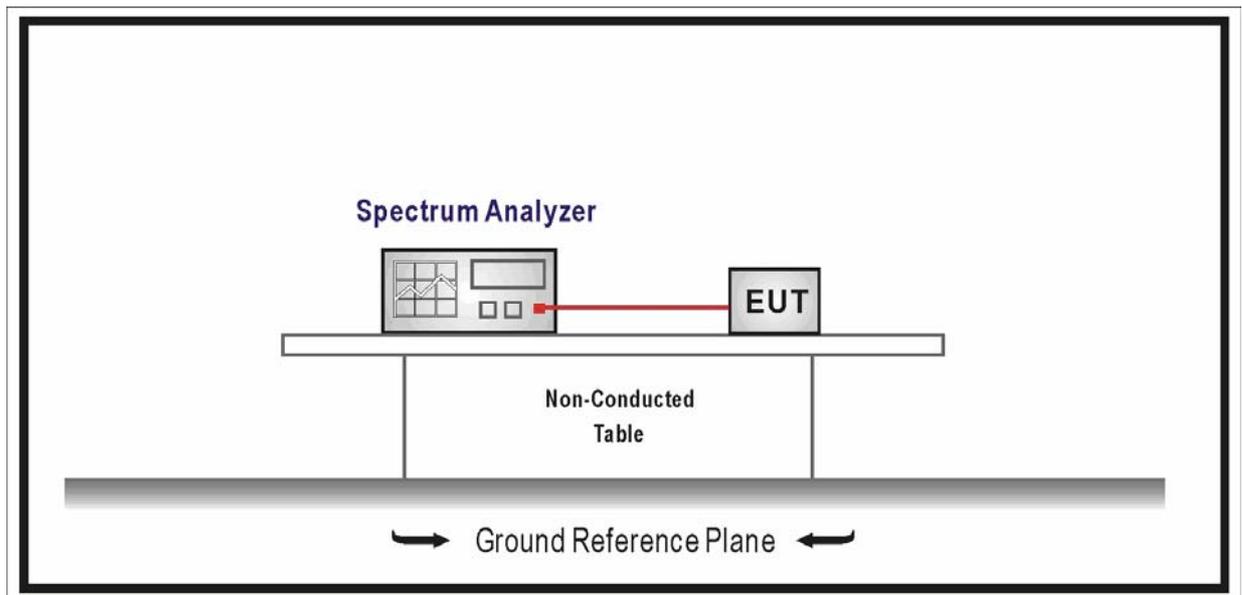
### 5.1. Test Equipment

RF Antenna Conducted Spurious / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2009/06/11
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	AC6-RF1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC6-TH	2009.03.31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 5.2. Test Setup



### 5.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### **5.4. Test Procedure**

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

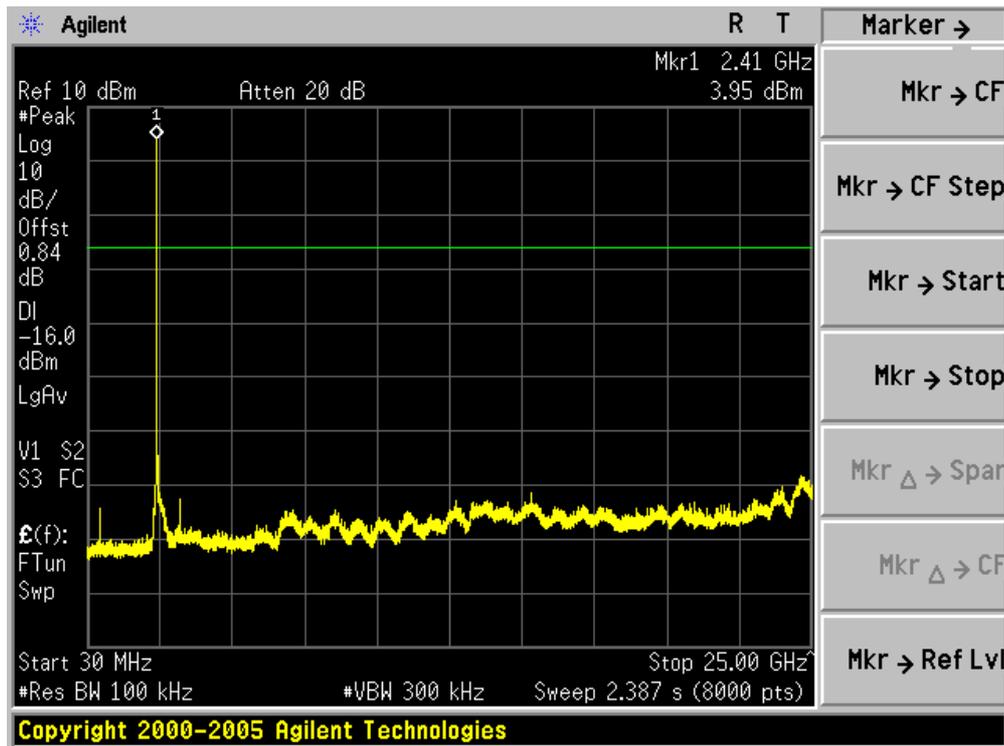
#### **5.5. Uncertainty**

The measurement uncertainty is defined as  $\pm 1.27$  dB

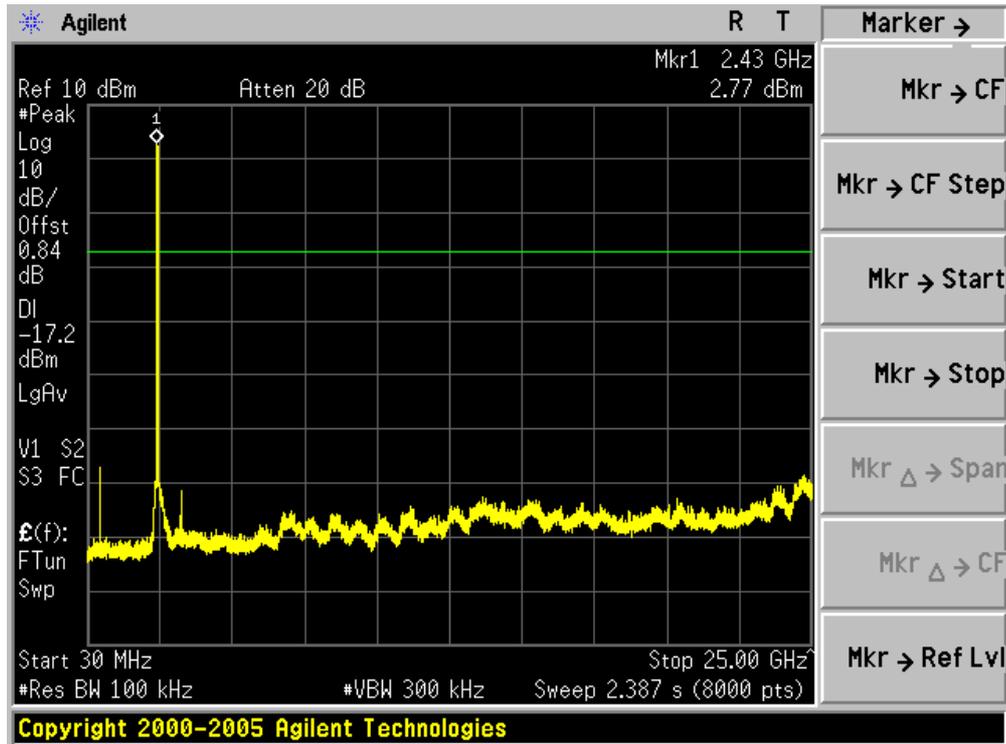
5.6. Test Result

Product	:	HSPA/ Wi-Fi Module
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	AC-6
Test Mode	:	Mode 1: Transmit by 802.11b

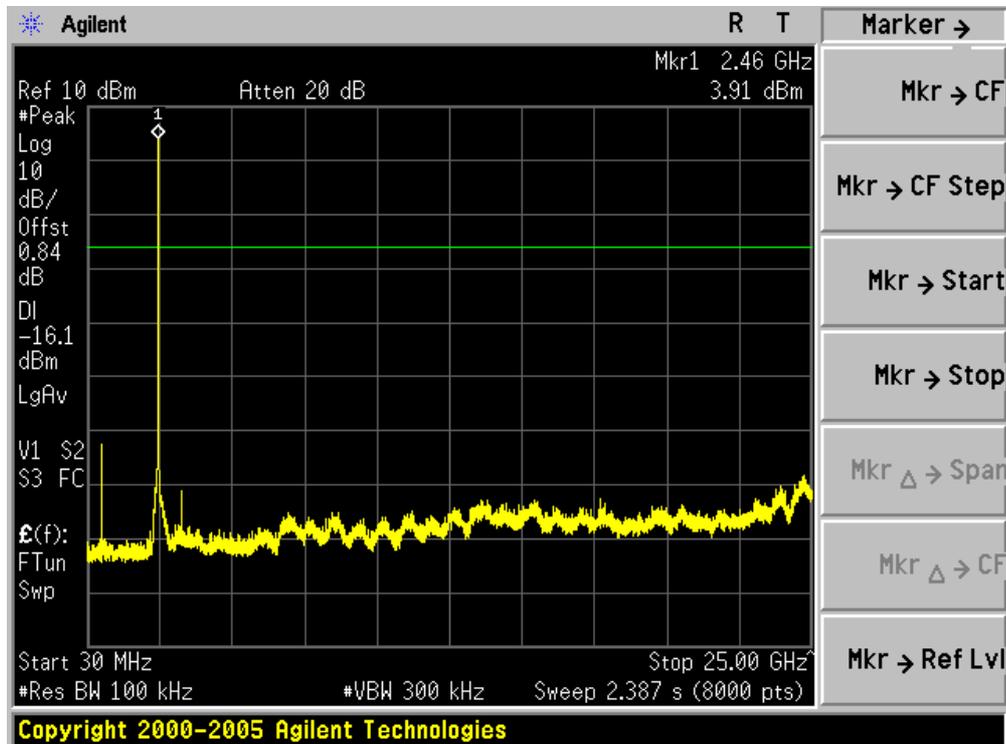
Channel 01 (2412MHz)



Channel 06 (2437MHz)

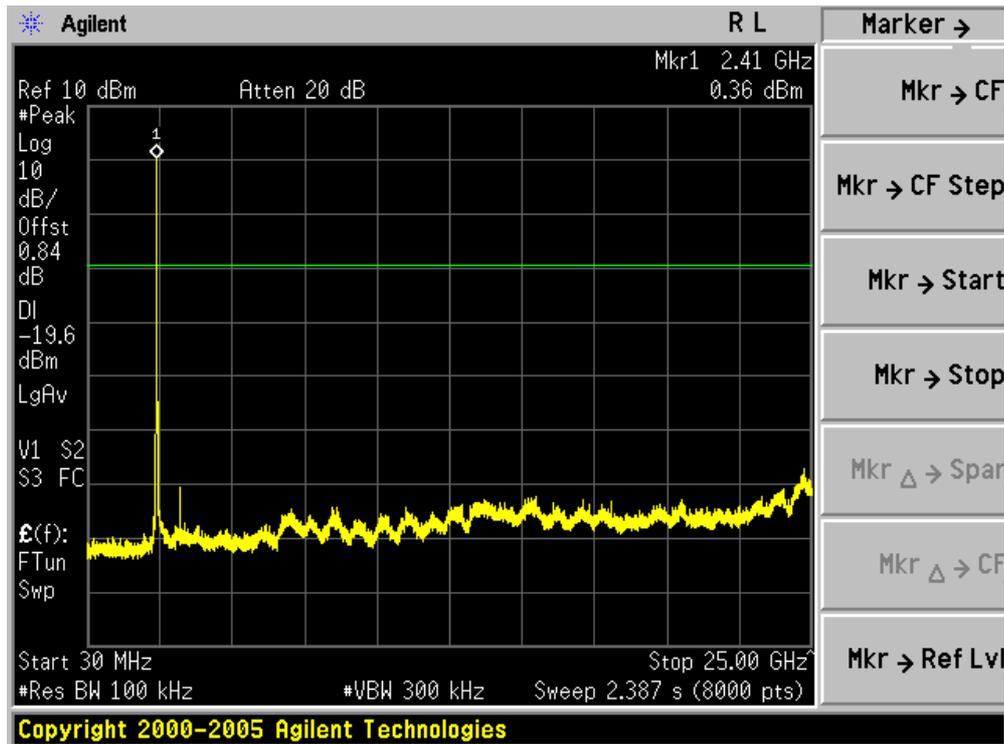


Channel 11 (2462MHz)

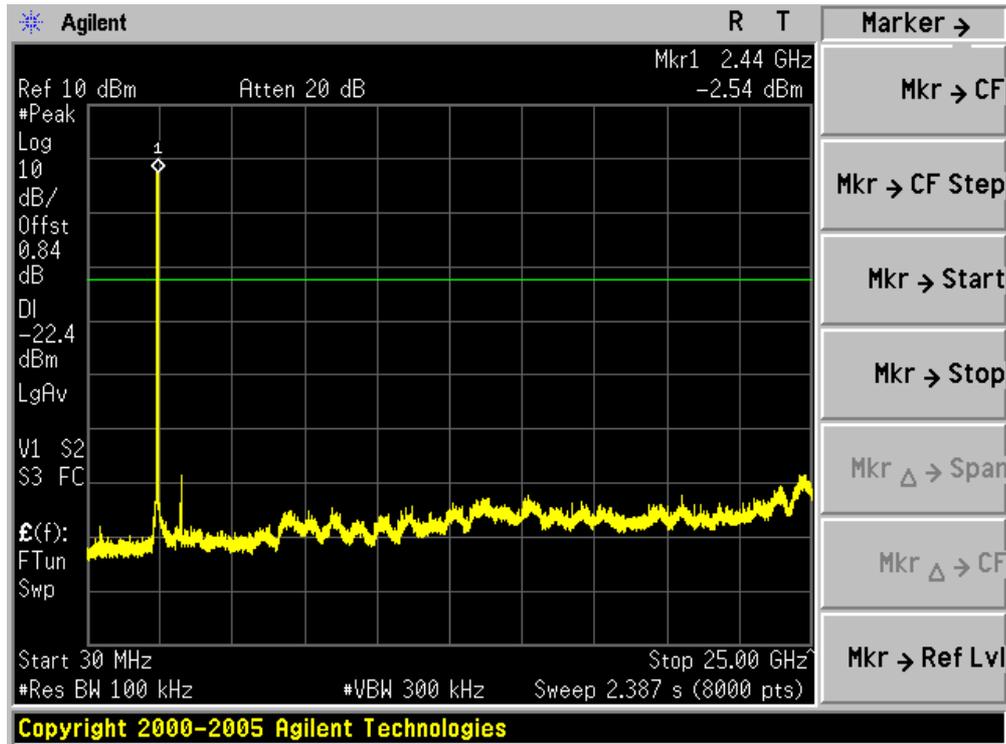


Product	: HSPA/ Wi-Fi Module
Test Item	: RF Antenna Conducted Spurious
Test Site	: AC-6
Test Mode	: Mode 2: Transmit by 802.11g

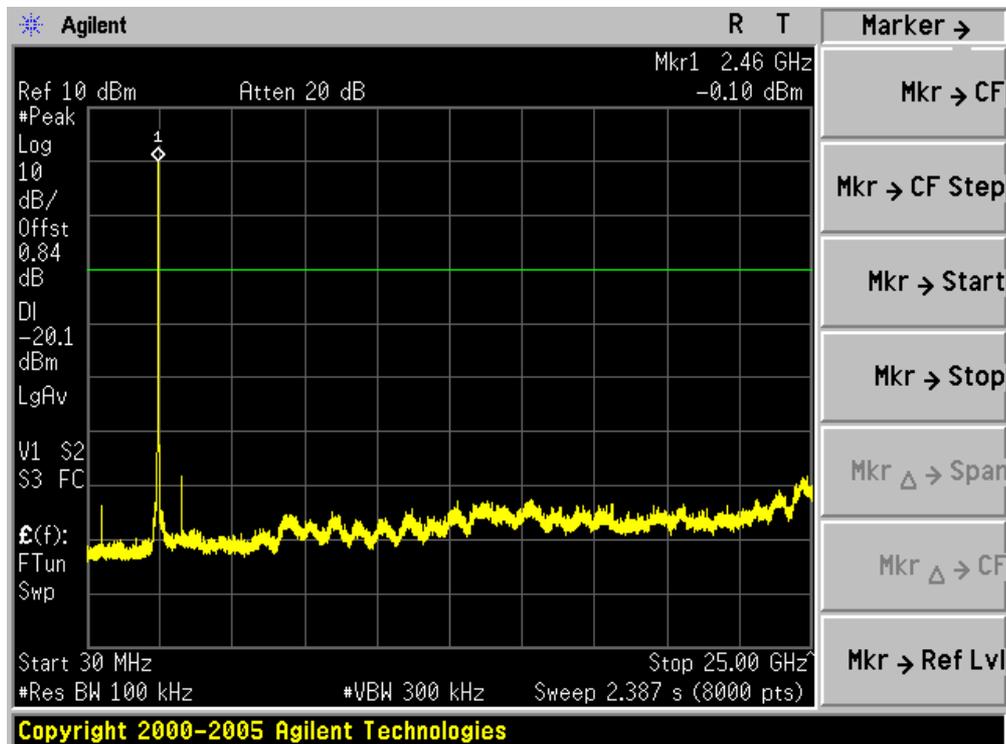
### Channel 01 (2412MHz)



Channel 06 (2437MHz)

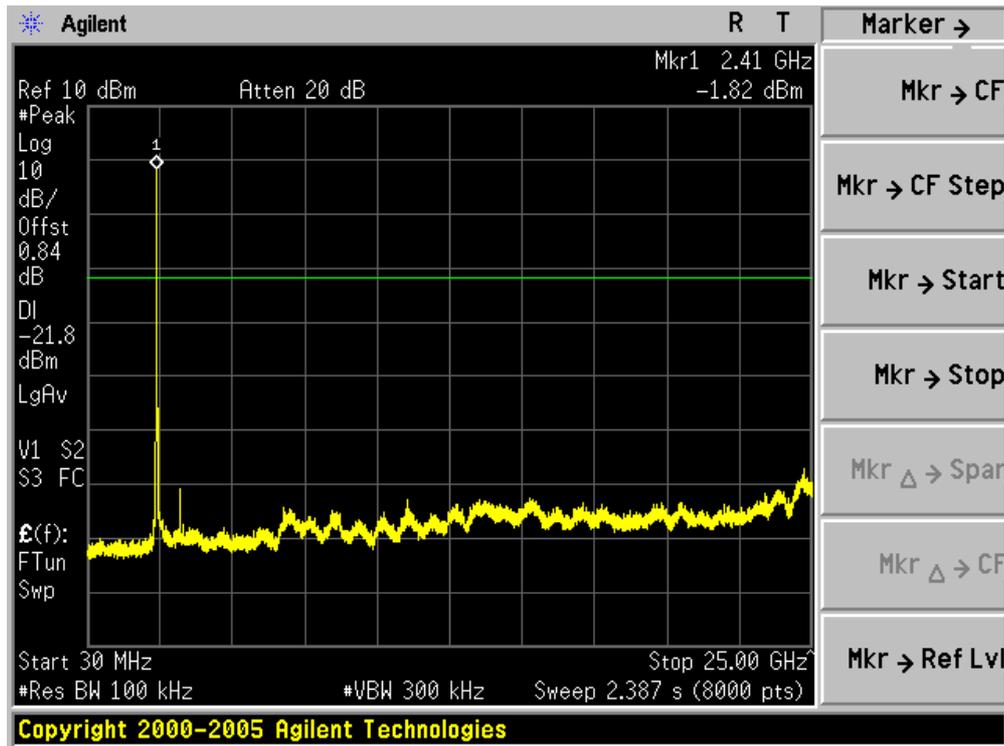


Channel 11 (2462MHz)

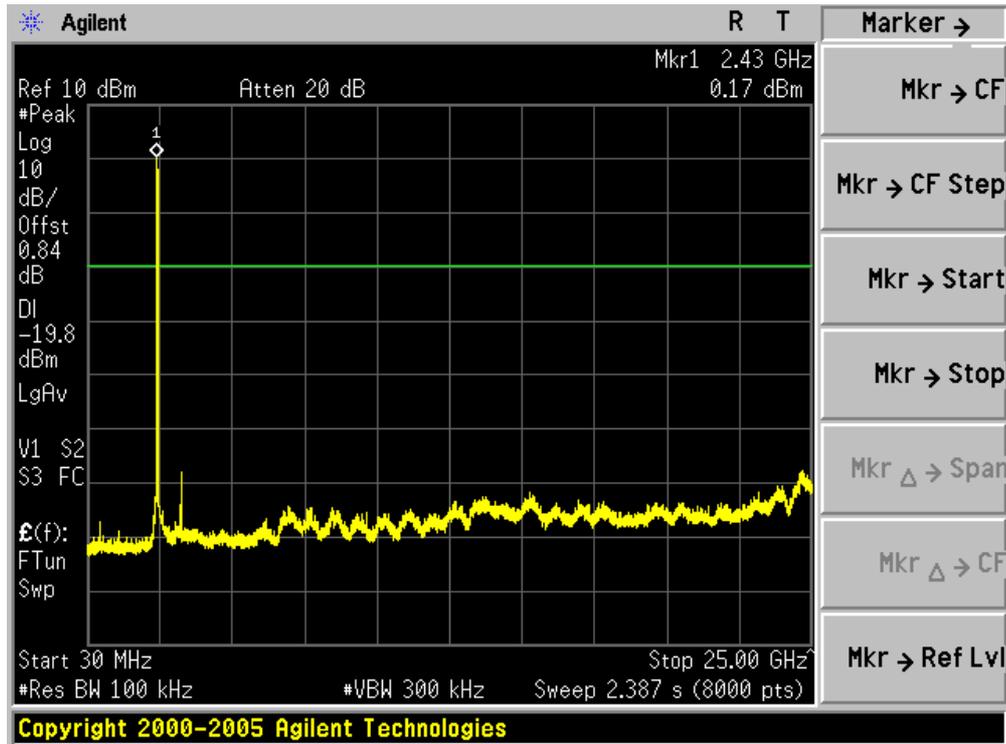


Product	: HSPA/ Wi-Fi Module
Test Item	: RF Antenna Conducted Spurious
Test Site	: AC-6
Test Mode	: Mode 3: Transmit by 802.11n(20MHz)

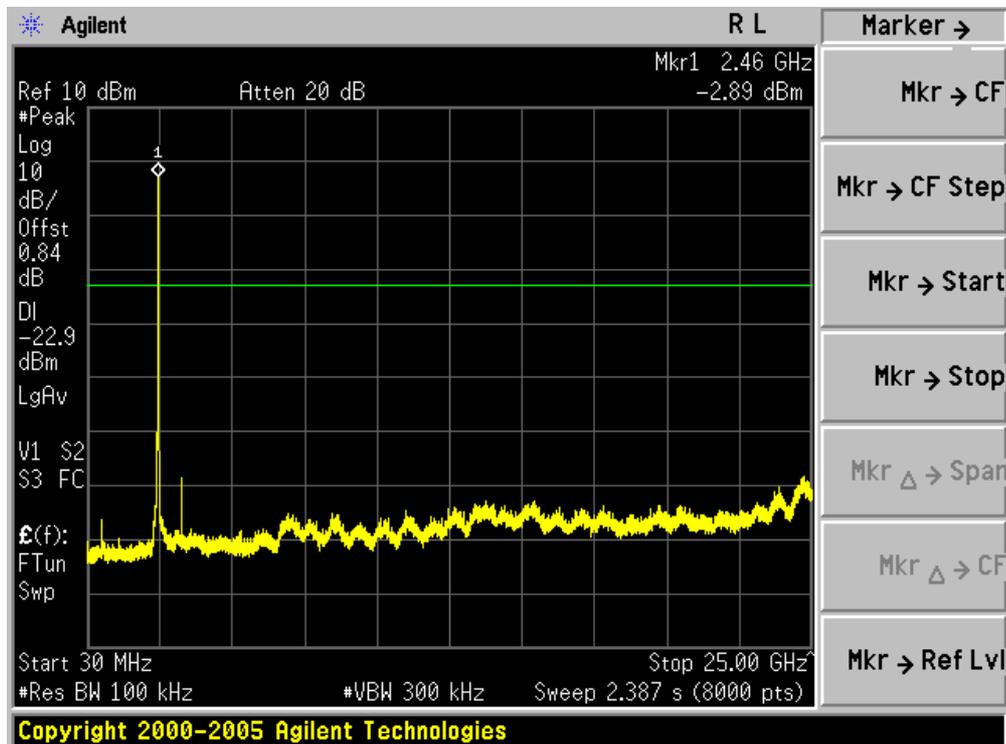
Channel 01 (2412MHz)



Channel 06 (2437MHz)

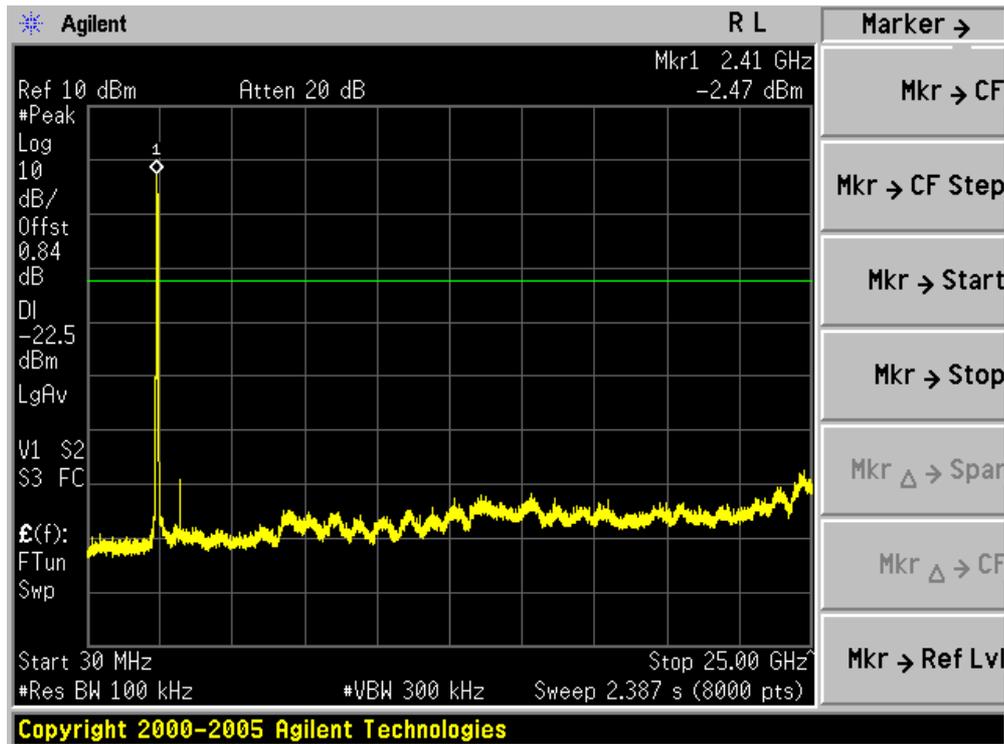


Channel 11 (2462MHz)

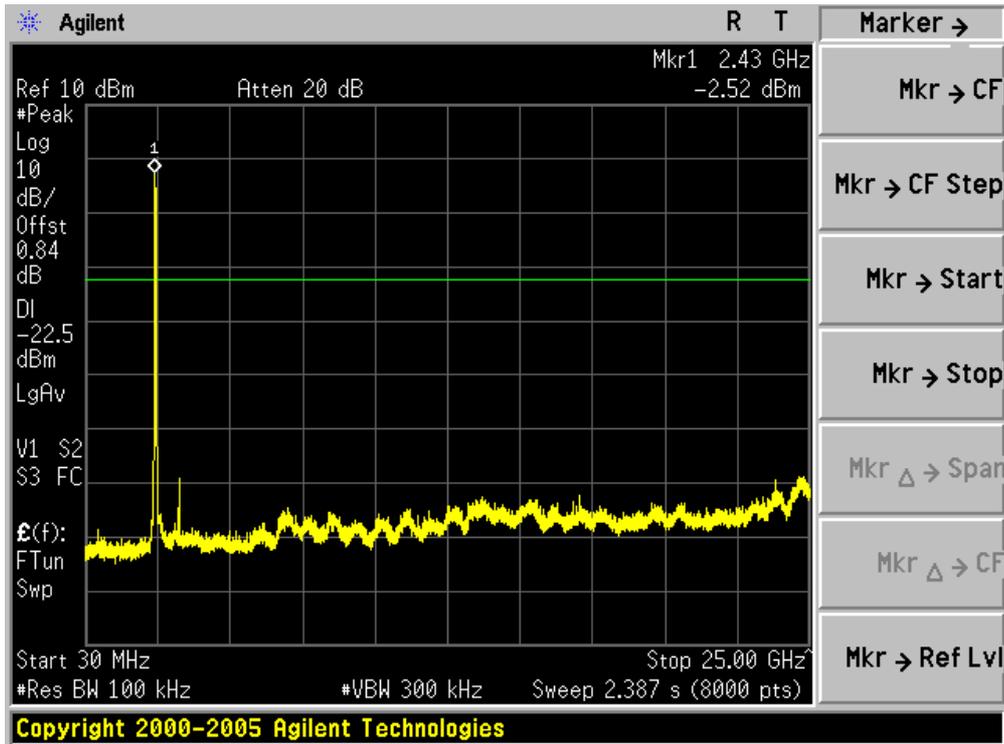


Product	: HSPA/ Wi-Fi Module
Test Item	: RF Antenna Conducted Spurious
Test Site	: AC-6
Test Mode	: Mode 4: Transmit by 802.11n(40MHz)

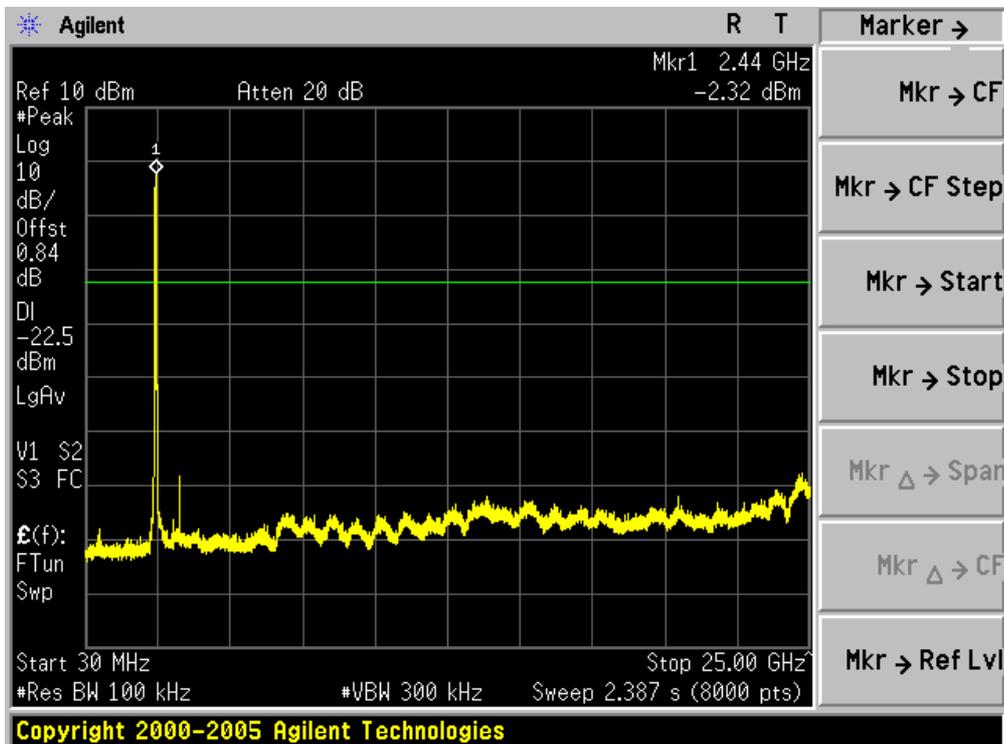
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



**6. Radiated Emission Band Edge**

**6.1. Test Equipment**

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2008/11/12
Preamplifier	Quietek	AP-180C	CHM-0602012	2008/11/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2009/06/11
50ohm Coaxial Switch	Anritsu	MP59B	6200447304	2008/11/24
Coaxial Cable	Huber+Suhner	AC2-C	04	2009/05/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2009/03/31

Radiated Emission / AC-3

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2009/04/23
Preamplifier	Quietek	AP-180C	CHM-0602012	2009/05/05
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2009/06/11
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2008/11/24
Coaxial Cable	Huber+Suhner	AC2-C	05	2009/05/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2009/03/31

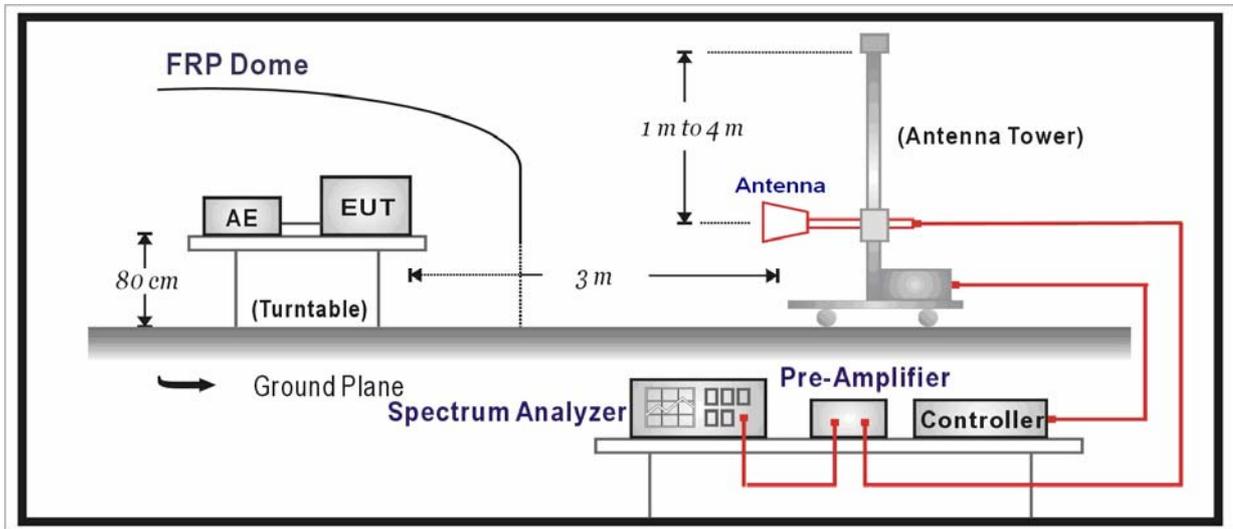
Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2009/04/23
Preamplifier	Quietek	AP-180C	CHM-0602013	2009/05/25
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2009.06.11
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2008/11/24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC5-TH	2009.03.31

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Note 2: The test instruments marked with "X" are used to measure the final test results.

**6.2. Test Setup**



**6.3. Limit**

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

**6.4. Test Procedure**

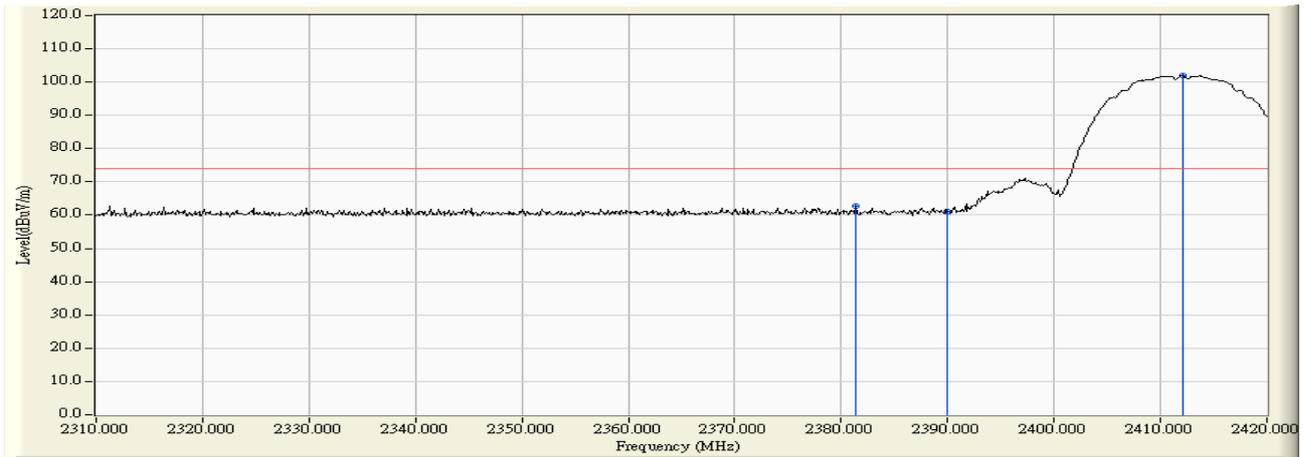
The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

**6.5. Uncertainty**

The measurement uncertainty above 1G is defined as  $\pm 3.9$  dB

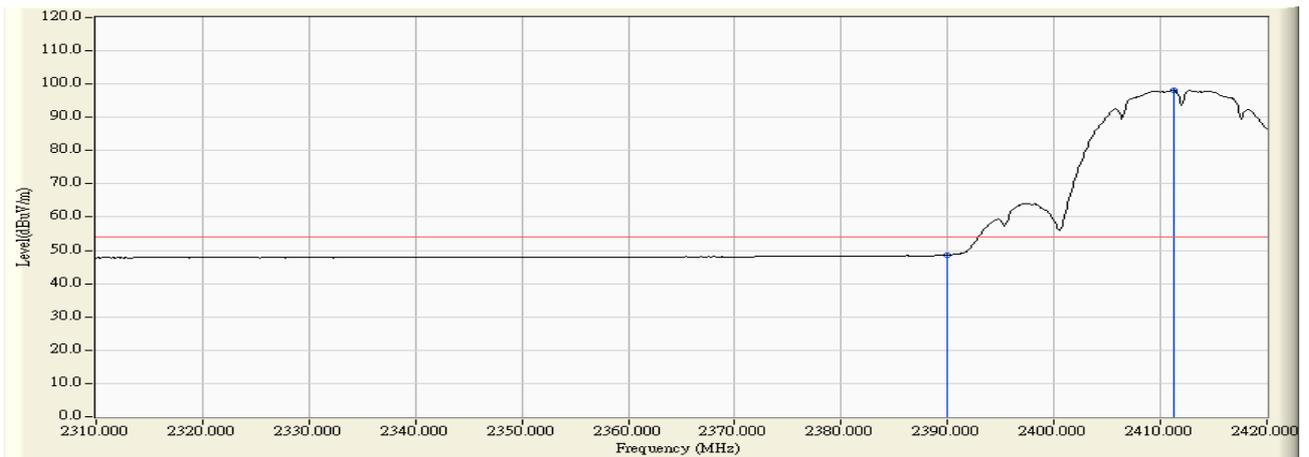
6.6. Test Result

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:27
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2412MHz



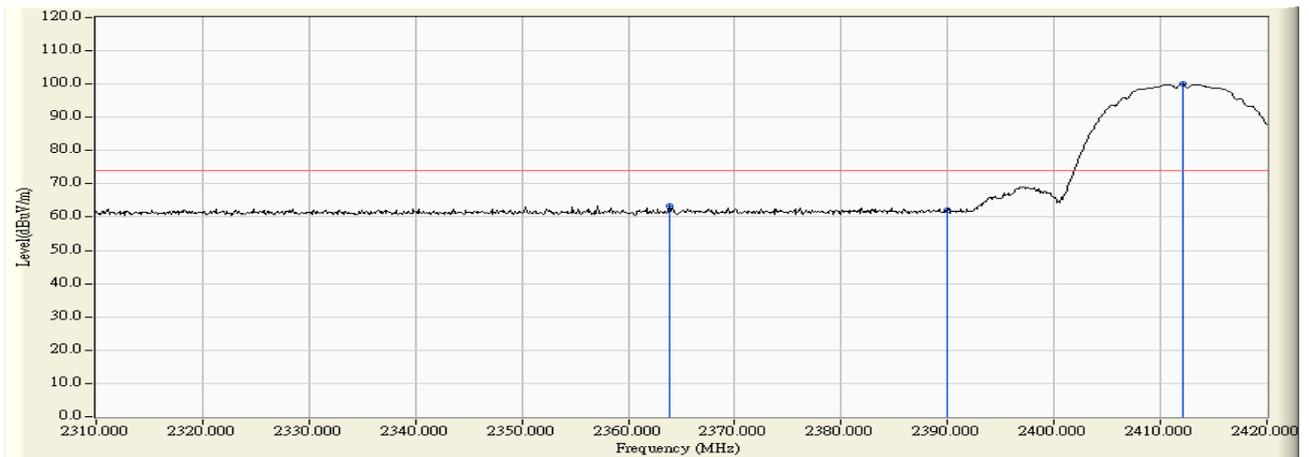
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2381.390	31.194	31.576	62.770	-11.200	73.970	PEAK
2		2390.000	31.184	29.824	61.008	-12.962	73.970	PEAK
3	*	2412.080	31.190	70.791	101.981	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:28
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2412MHz



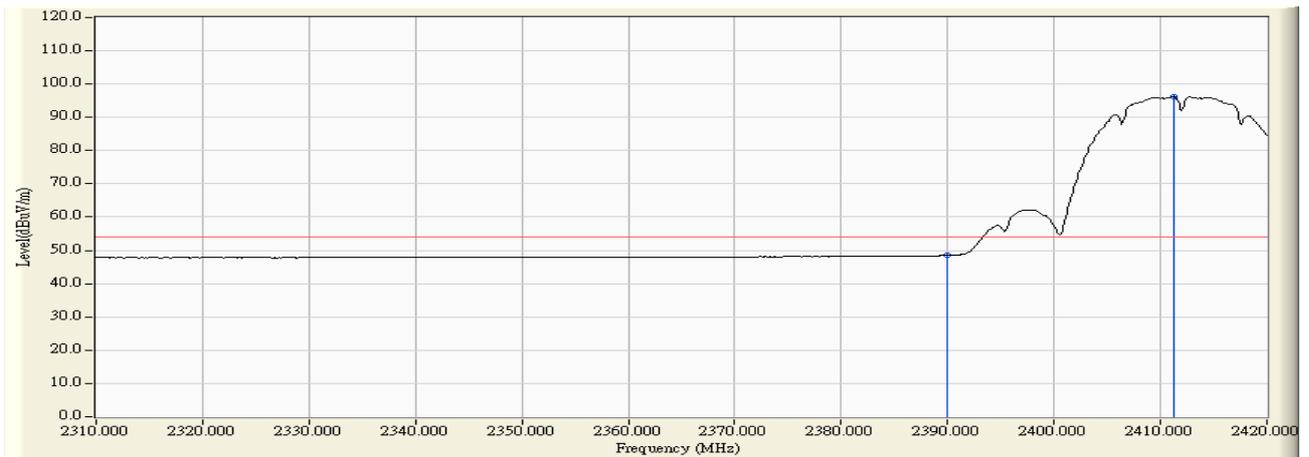
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	17.478	48.662	-5.308	53.970	AVERAGE
2	*	2411.200	31.190	67.080	98.270	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:32
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2412MHz



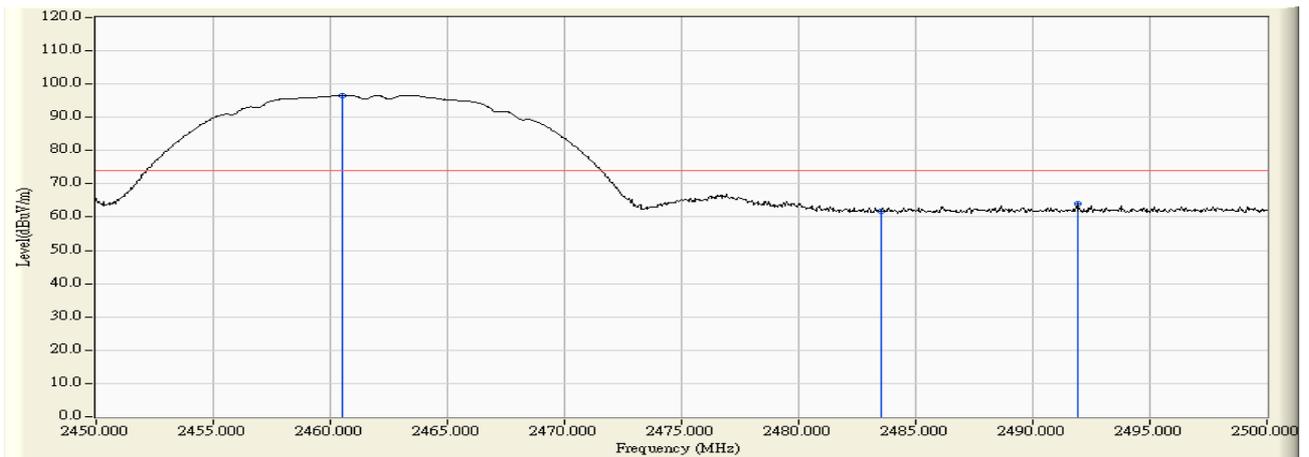
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2363.900	31.213	32.204	63.417	-10.553	73.970	PEAK
2		2390.000	31.184	31.017	62.201	-11.769	73.970	PEAK
3	*	2412.080	31.190	68.772	99.962	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:33
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2412MHz



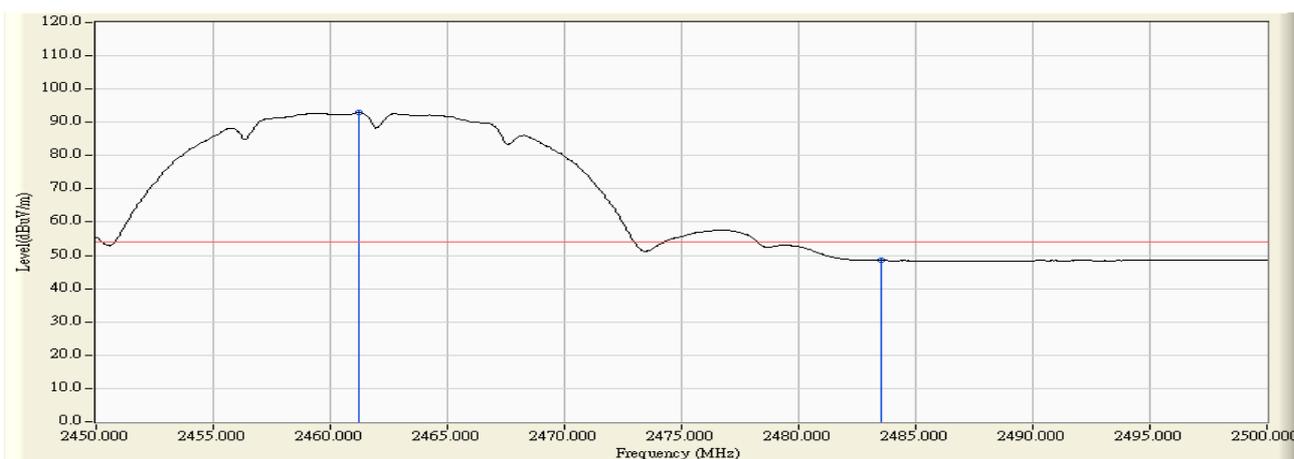
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	17.287	48.471	-5.499	53.970	AVERAGE
2	*	2411.200	31.190	65.162	96.352	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:40
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2462MHz



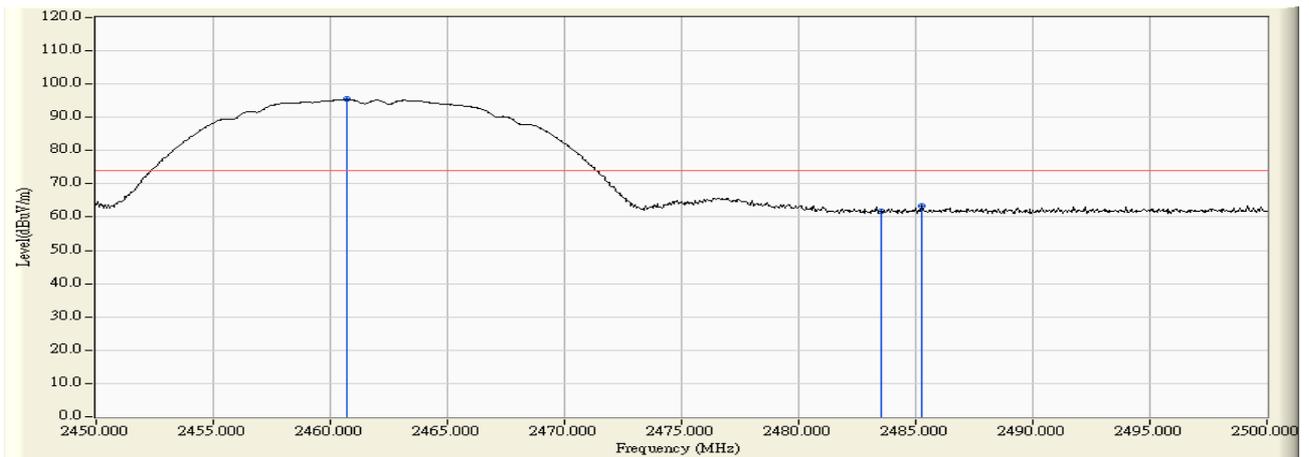
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2460.500	31.225	65.415	96.640	N/A	N/A	PEAK
2		2483.500	31.212	30.699	61.911	-12.059	73.970	PEAK
3		2491.900	31.206	32.882	64.089	-9.881	73.970	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:41
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2462MHz



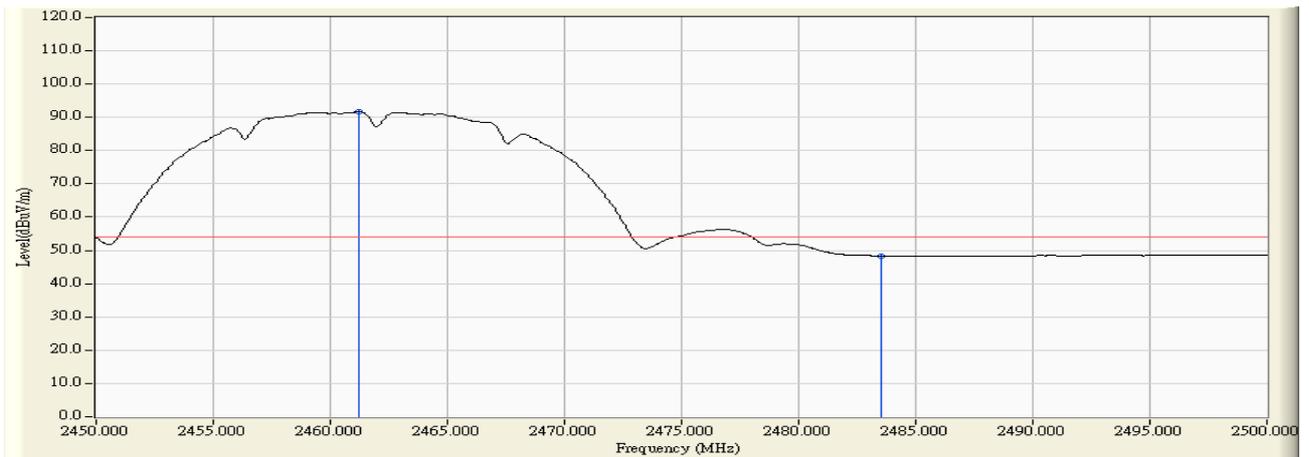
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2461.200	31.225	61.664	92.889	N/A	N/A	AVERAGE
2		2483.500	31.212	17.253	48.465	-5.505	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:45
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2462MHz



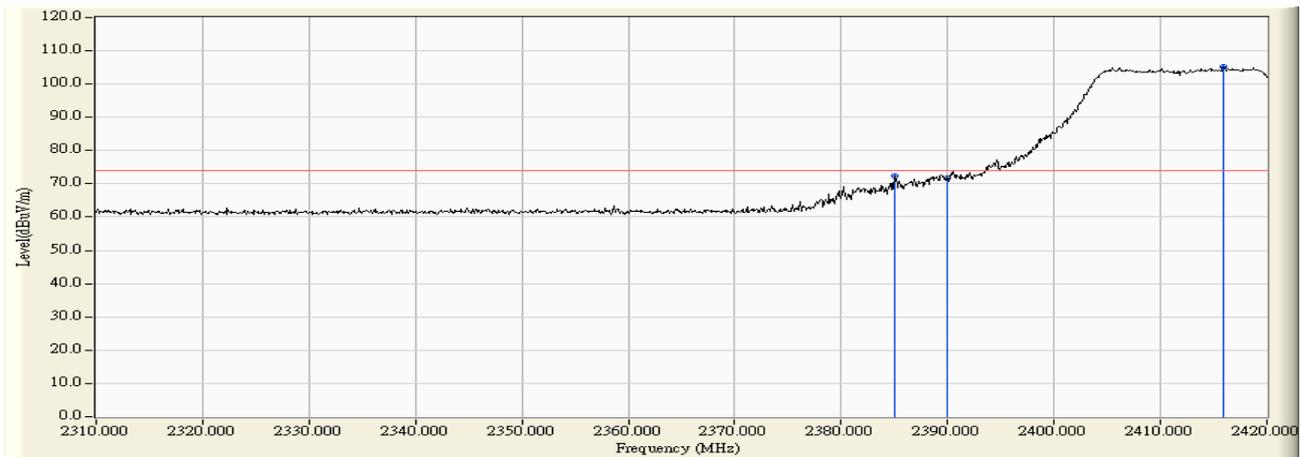
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2460.700	31.225	64.166	95.391	N/A	N/A	PEAK
2		2483.500	31.212	30.497	61.709	-12.261	73.970	PEAK
3		2485.250	31.211	32.074	63.285	-10.685	73.970	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:45
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11b at channel 2462MHz



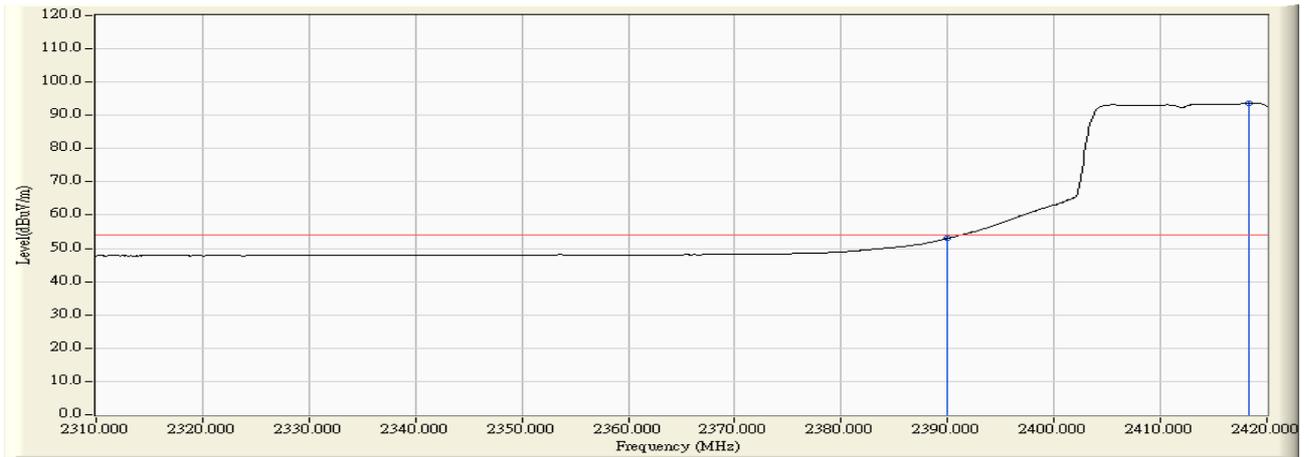
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2461.200	31.225	60.539	91.764	N/A	N/A	AVERAGE
2		2483.500	31.212	17.157	48.369	-5.601	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 13:54
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2412MHz



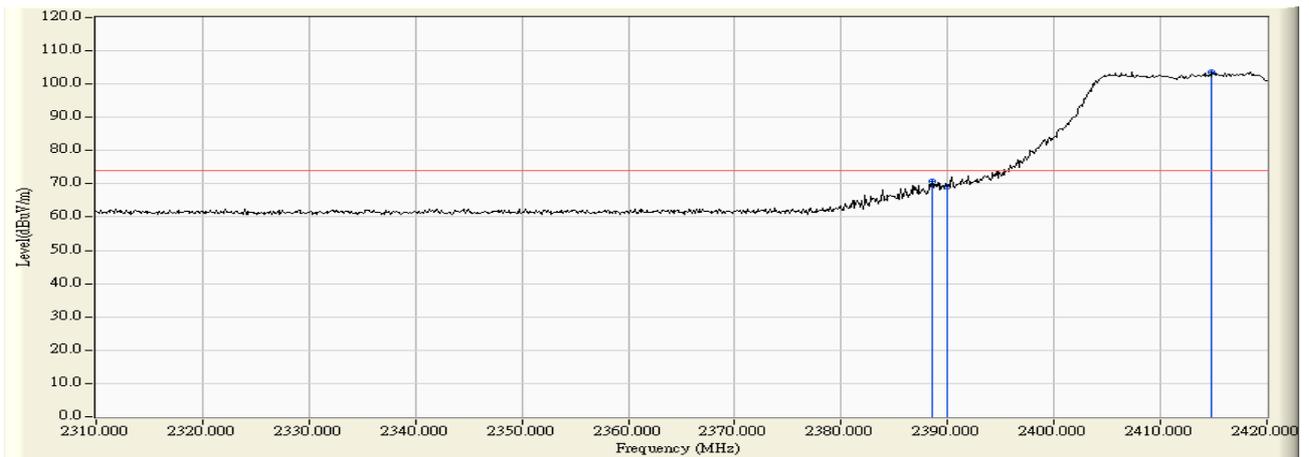
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2385.020	31.190	41.225	72.415	-1.555	73.970	PEAK
2		2390.000	31.184	40.475	71.659	-2.311	73.970	PEAK
3	*	2415.930	31.194	74.144	105.338	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 13:57
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2412MHz



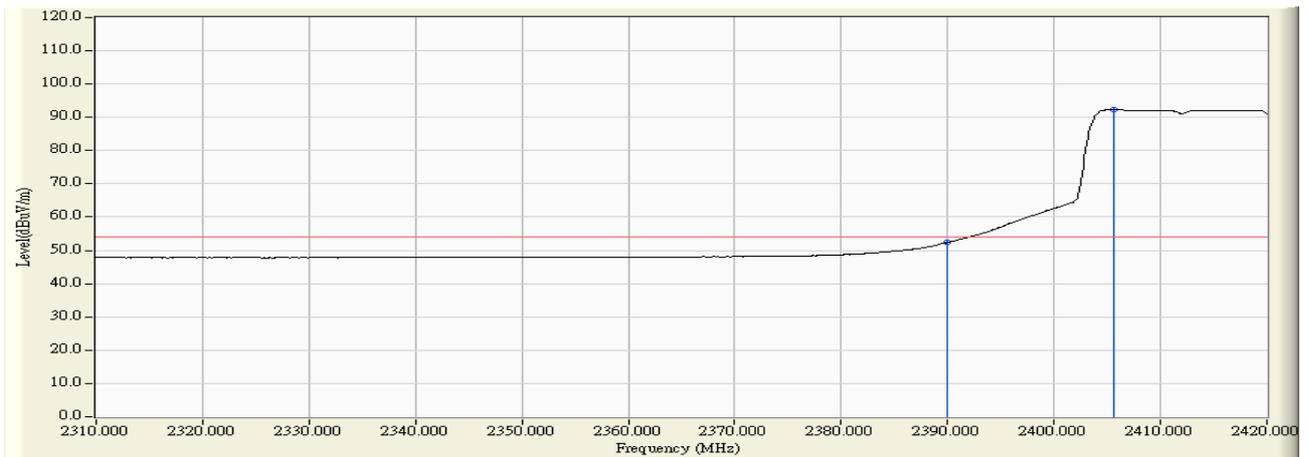
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	21.843	53.027	-0.943	53.970	AVERAGE
2	*	2418.240	31.196	62.413	93.609	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:04
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2412MHz



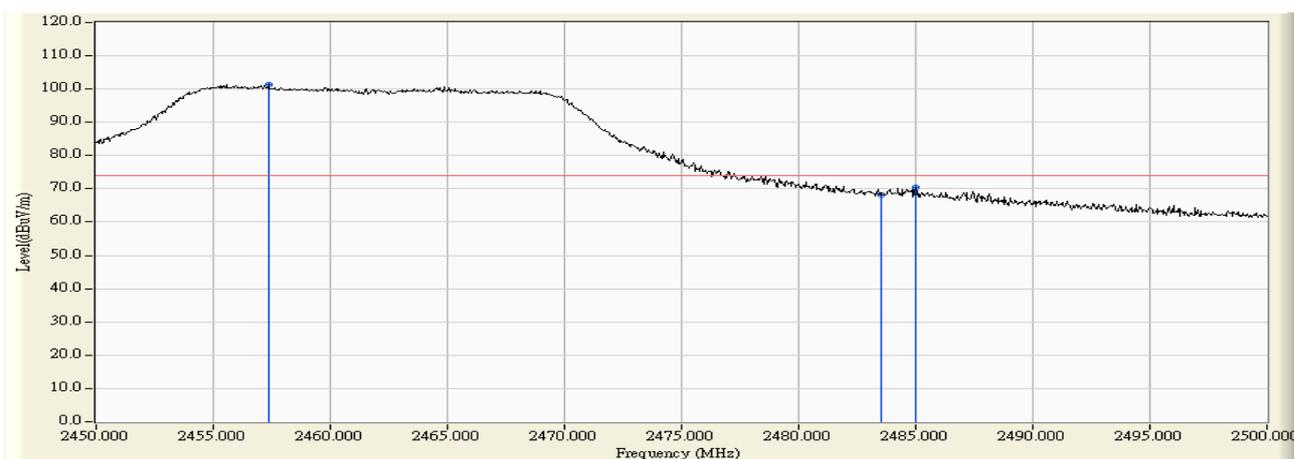
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2388.540	31.186	39.552	70.738	-3.232	73.970	PEAK
2		2390.000	31.184	38.121	69.305	-4.665	73.970	PEAK
3	*	2414.830	31.193	72.523	103.716	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:05
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2412MHz



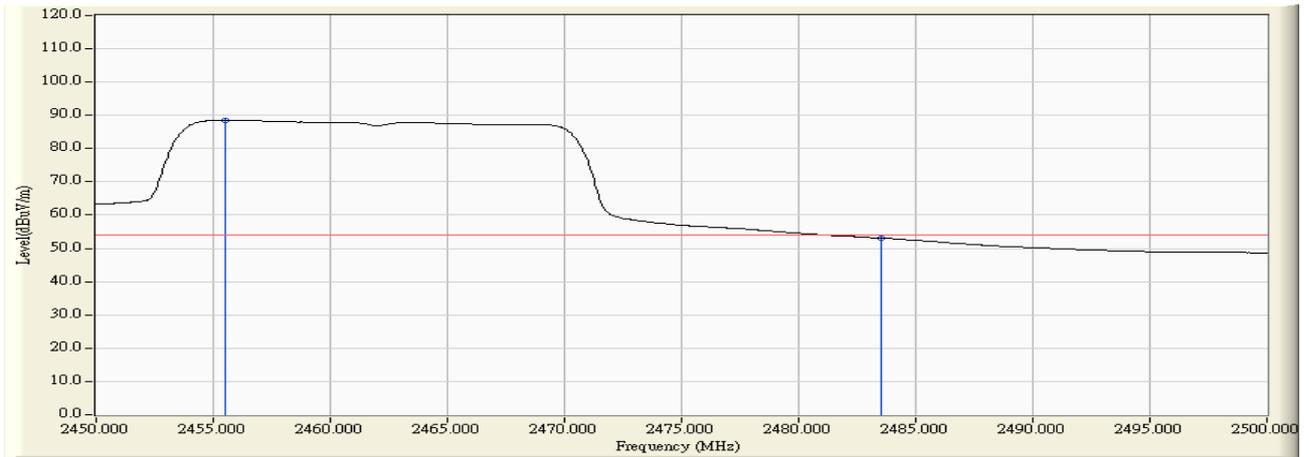
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	21.223	52.407	-1.563	53.970	AVERAGE
2	*	2405.590	31.186	61.134	92.320	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:10
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2462MHz



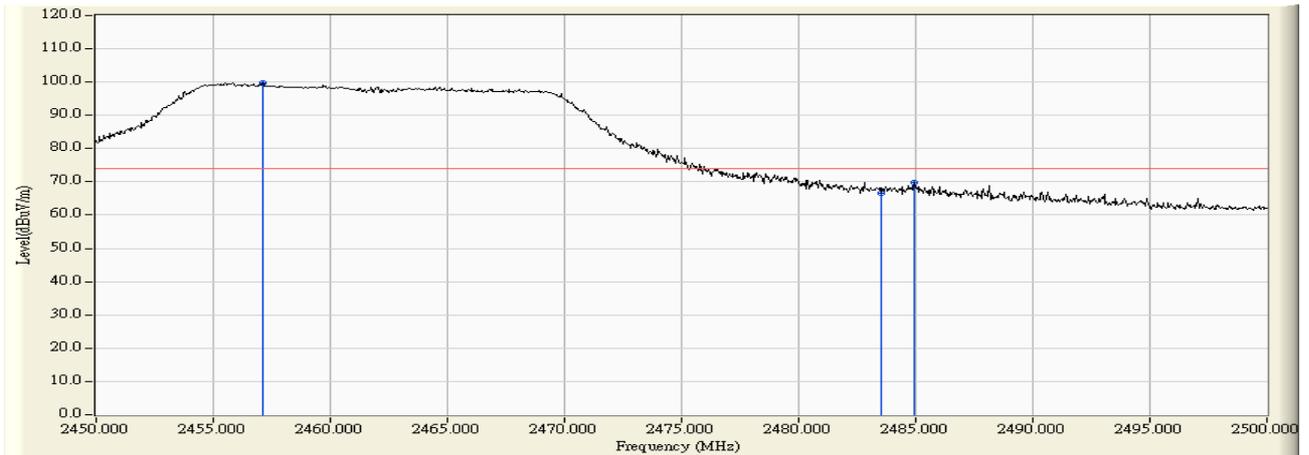
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2457.350	31.223	69.991	101.214	N/A	N/A	PEAK
2		2483.500	31.212	36.897	68.109	-5.861	73.970	PEAK
3		2485.000	31.211	39.232	70.443	-3.527	73.970	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:16
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2462MHz



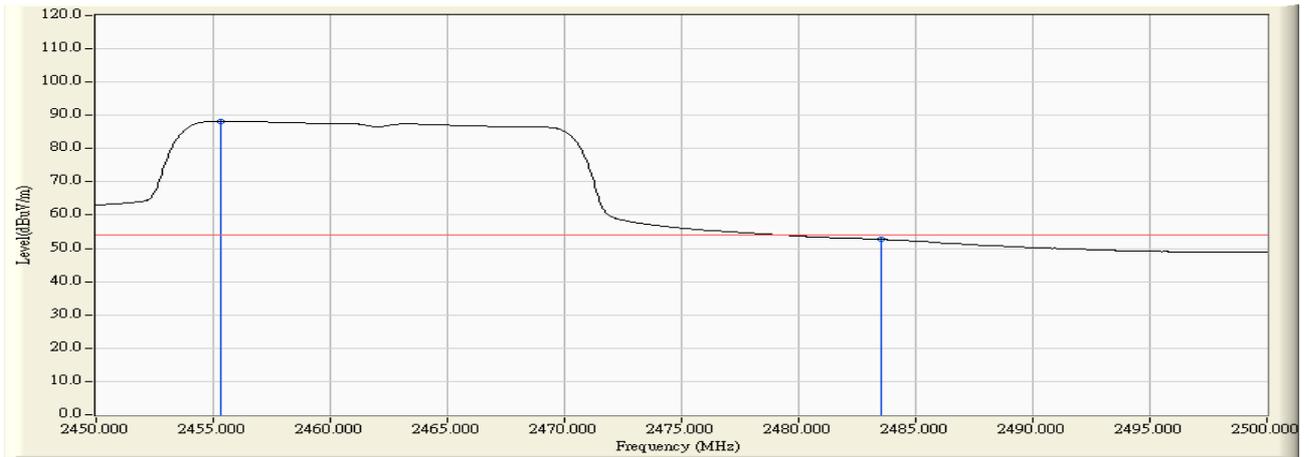
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.500	31.223	57.355	88.578	N/A	N/A	AVERAGE
2		2483.500	31.212	21.907	53.119	-0.851	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:21
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2462MHz



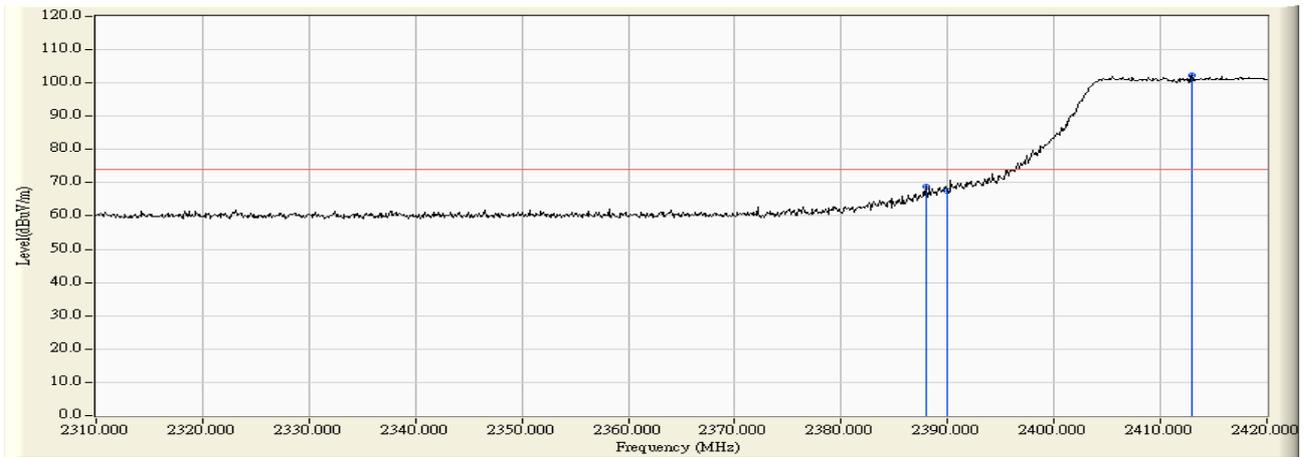
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2457.100	31.223	68.465	99.688	N/A	N/A	PEAK
2		2483.500	31.212	35.360	66.572	-7.398	73.970	PEAK
3		2484.950	31.212	38.549	69.760	-4.210	73.970	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:23
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 2: Transmit by 802.11g at channel 2462MHz



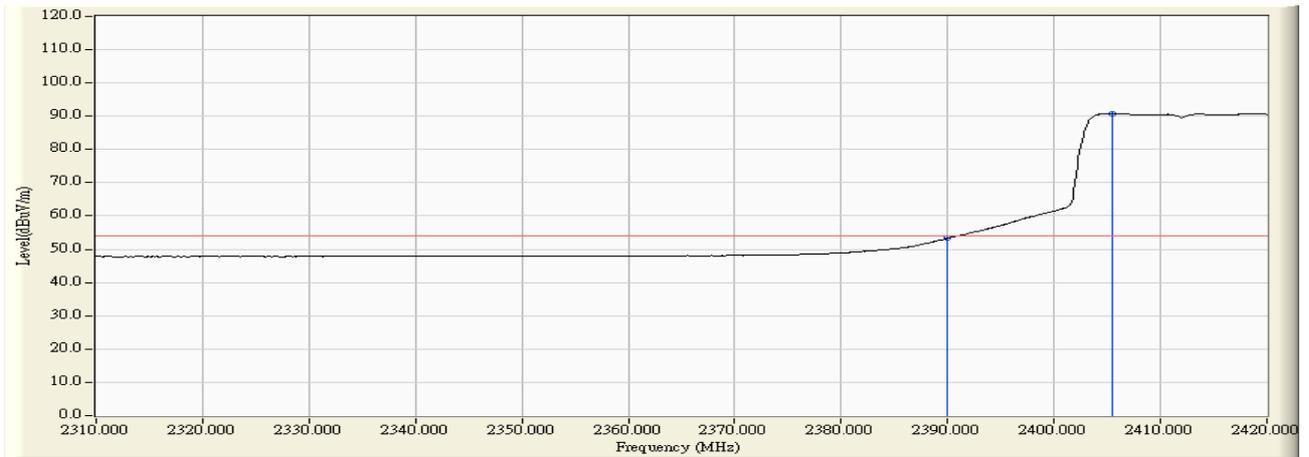
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.350	31.223	57.028	88.251	N/A	N/A	AVERAGE
2		2483.500	31.212	21.455	52.667	-1.303	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:59
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2412MHz



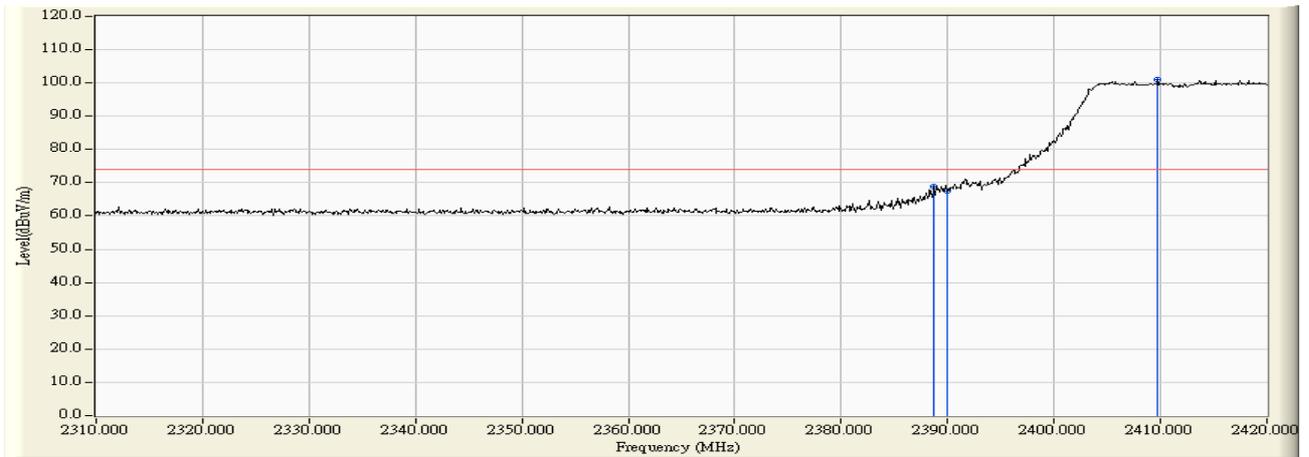
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2387.990	31.187	37.801	68.988	-4.982	73.970	PEAK
2		2390.000	31.184	36.348	67.532	-6.438	73.970	PEAK
3	*	2412.960	31.191	71.030	102.221	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 14:58
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2412MHz



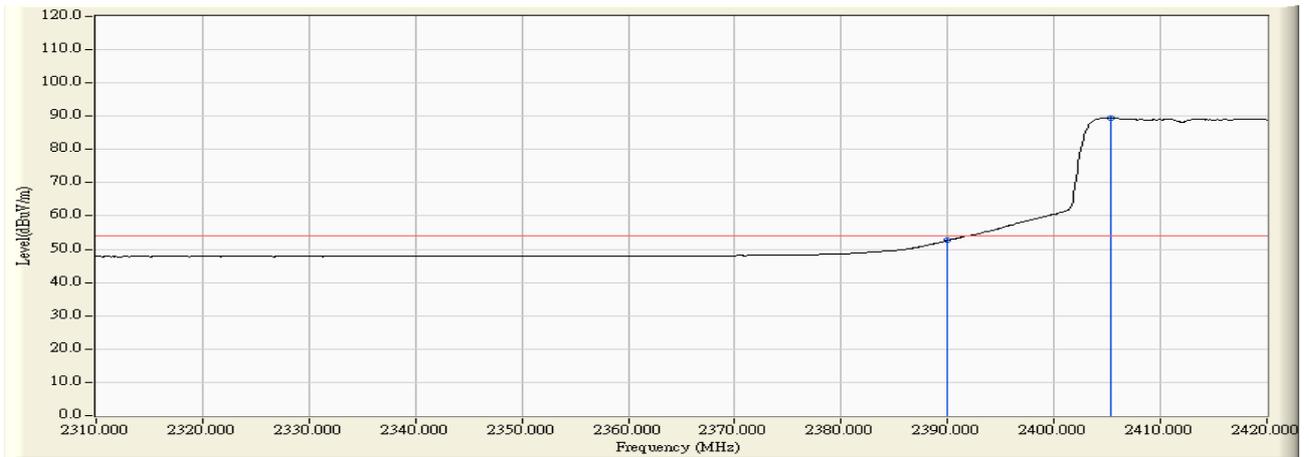
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	22.110	53.294	-0.676	53.970	AVERAGE
2	*	2405.480	31.186	59.536	90.722	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:10
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2412MHz



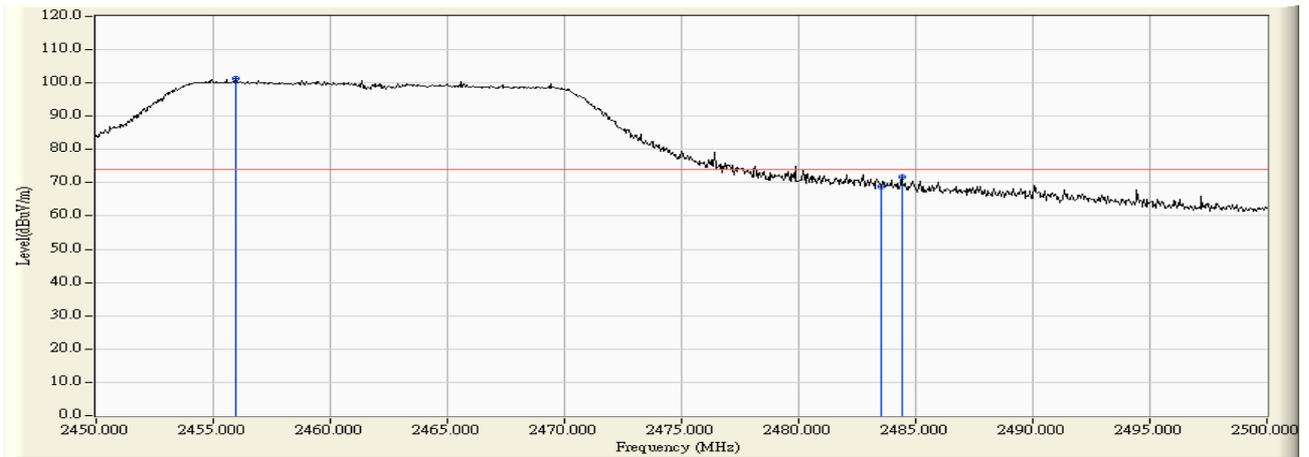
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2388.760	31.185	37.568	68.754	-5.216	73.970	PEAK
2		2390.000	31.184	36.402	67.586	-6.384	73.970	PEAK
3	*	2409.770	31.189	69.859	101.048	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:11
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2412MHz



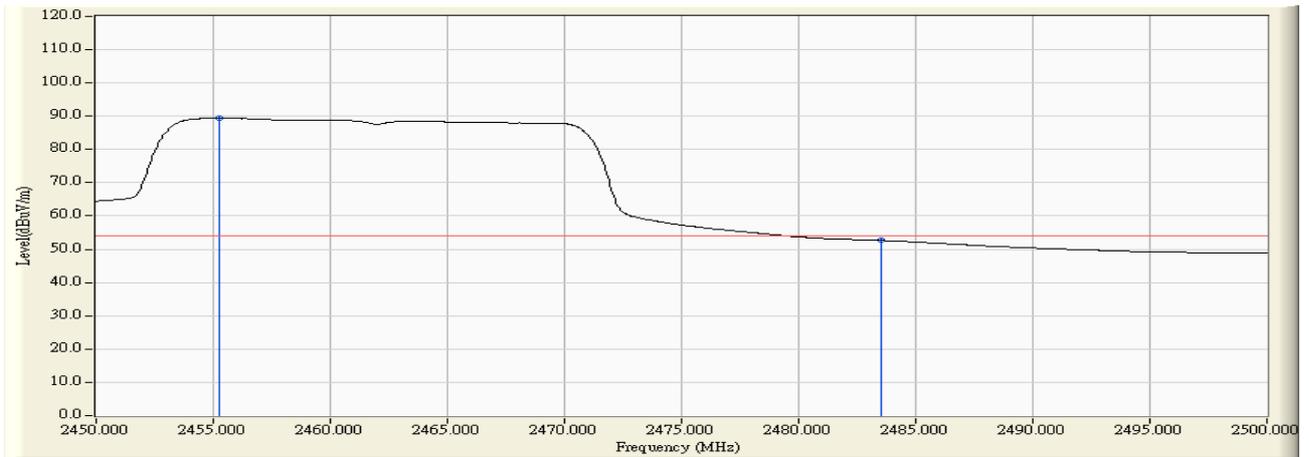
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	21.487	52.671	-1.299	53.970	AVERAGE
2	*	2405.370	31.186	58.202	89.388	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:14
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2462MHz



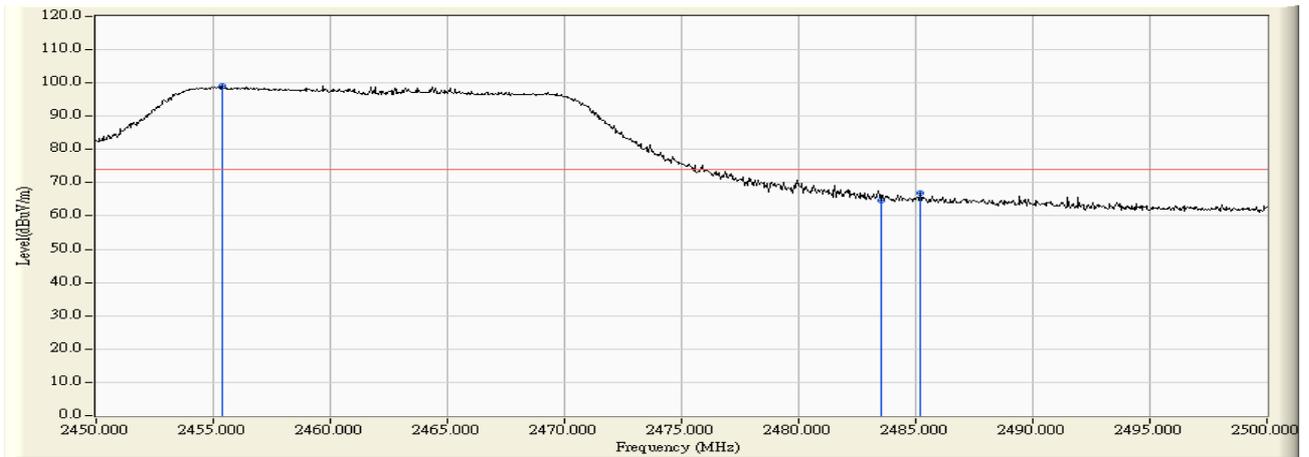
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.950	31.223	70.041	101.264	N/A	N/A	PEAK
2		2483.500	31.212	37.583	68.795	-5.175	73.970	PEAK
3		2484.400	31.212	40.404	71.615	-2.355	73.970	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:14
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2462MHz



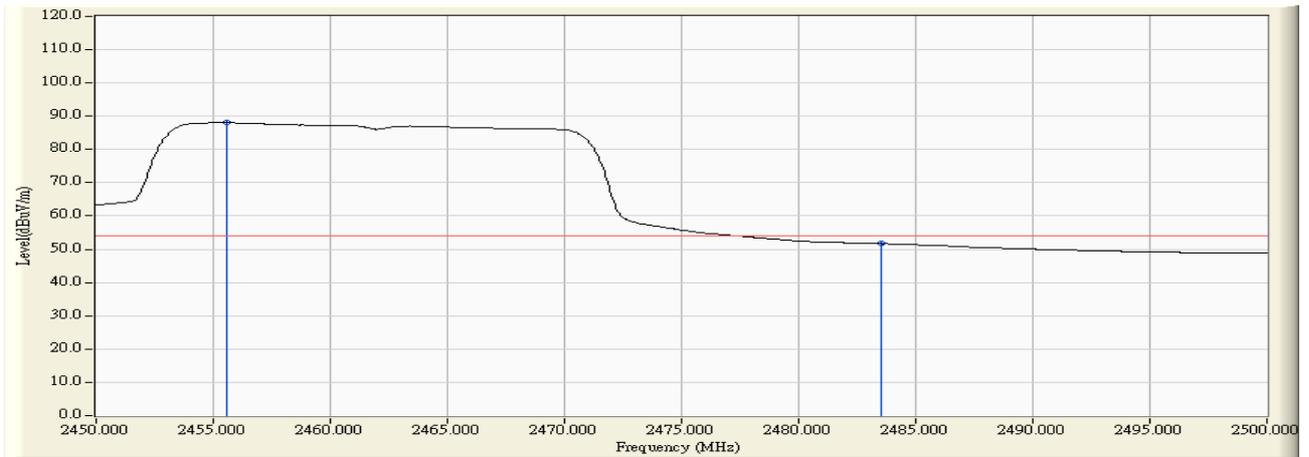
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.250	31.223	58.180	89.403	N/A	N/A	AVERAGE
2		2483.500	31.212	21.430	52.642	-1.328	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:21
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2462MHz



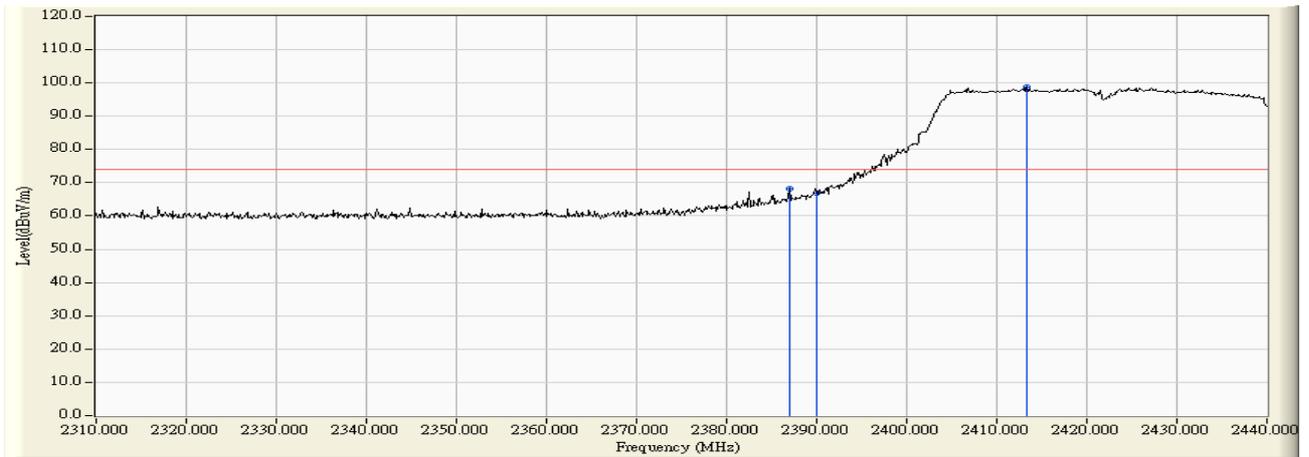
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.400	31.223	67.922	99.145	N/A	N/A	PEAK
2		2483.500	31.212	33.426	64.638	-9.332	73.970	PEAK
3		2485.200	31.211	35.763	66.974	-6.996	73.970	PEAK

<b>Engineer : Robin</b>	
<b>Site : AC-5 (3m Semi-Anechoic Chamber)</b>	<b>Time : 2009/05/15 - 15:22</b>
<b>Limit : FCC_SpartC_15.209_03M_AV</b>	<b>Margin : 0</b>
<b>EUT : HSPA/ Wi-Fi Module</b>	<b>Probe : 9120D_499(1-18GHz) - VERTICAL</b>
<b>Power : AC 120V/60Hz</b>	<b>Note : Mode 3: Transmit by 802.11n(20MHz) at channel 2462MHz</b>



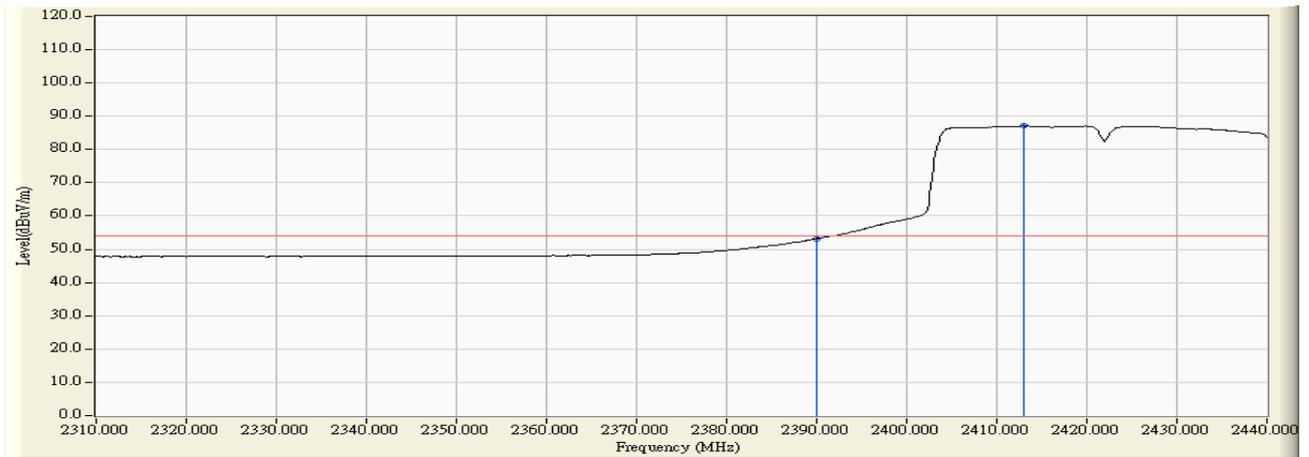
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.600	31.223	56.809	88.032	N/A	N/A	AVERAGE
2		2483.500	31.212	20.450	51.662	-2.308	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:29
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2422MHz



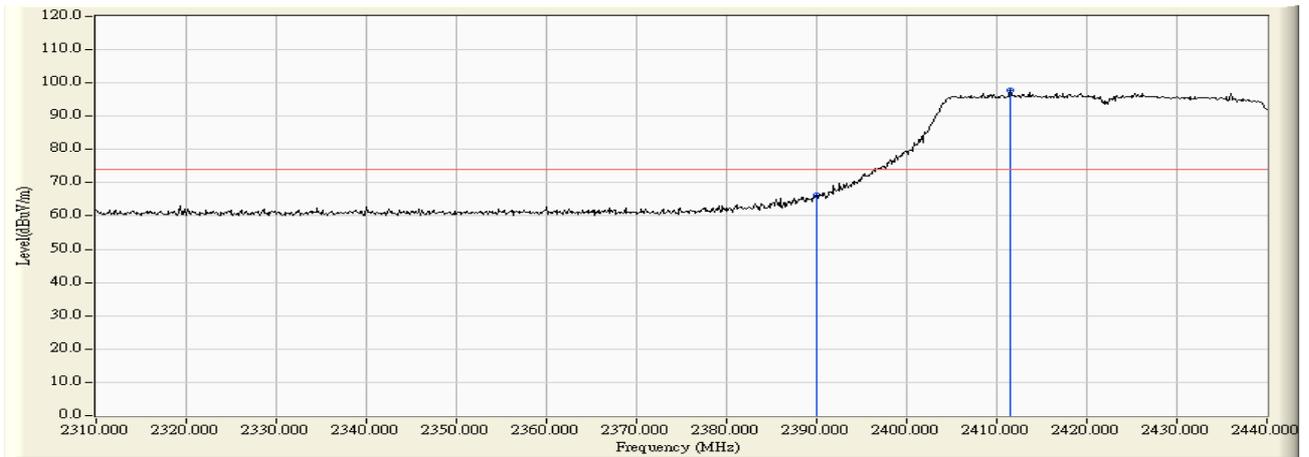
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2386.960	31.187	37.088	68.276	-5.694	73.970	PEAK
2		2390.000	31.184	35.876	67.060	-6.910	73.970	PEAK
3	*	2413.350	31.192	67.578	98.770	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:27
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2422MHz



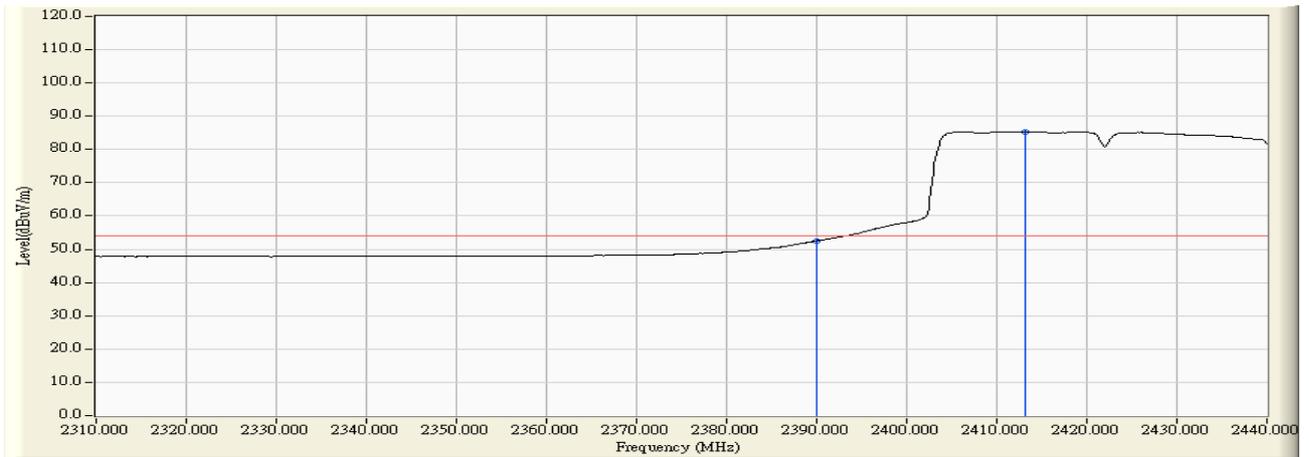
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	22.045	53.229	-0.741	53.970	AVERAGE
2	*	2412.960	31.191	55.851	87.042	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:31
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2422MHz



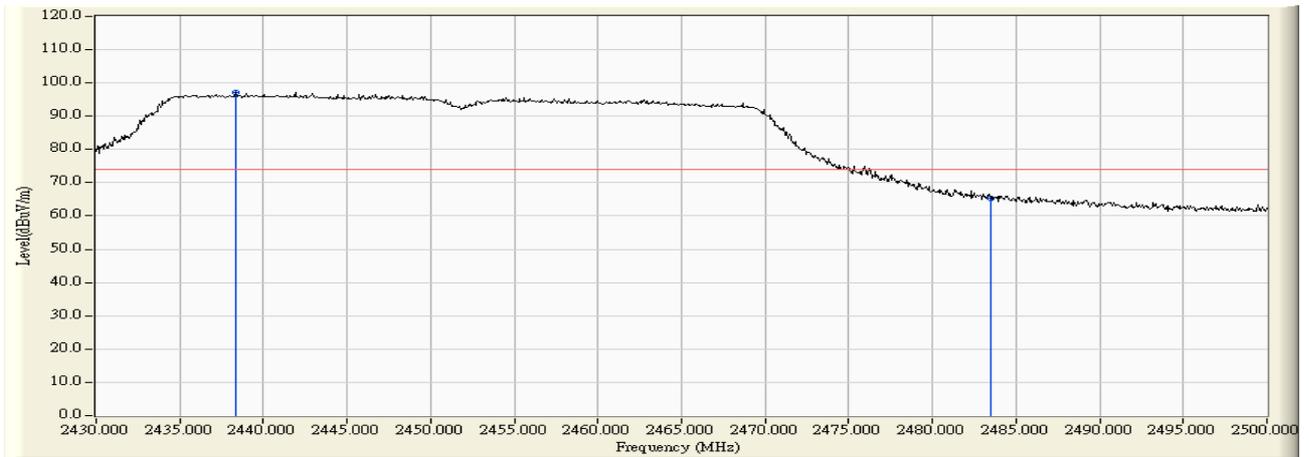
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	35.007	66.191	-7.779	73.970	PEAK
2	*	2411.530	31.190	66.484	97.674	N/A	N/A	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:32
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2422MHz



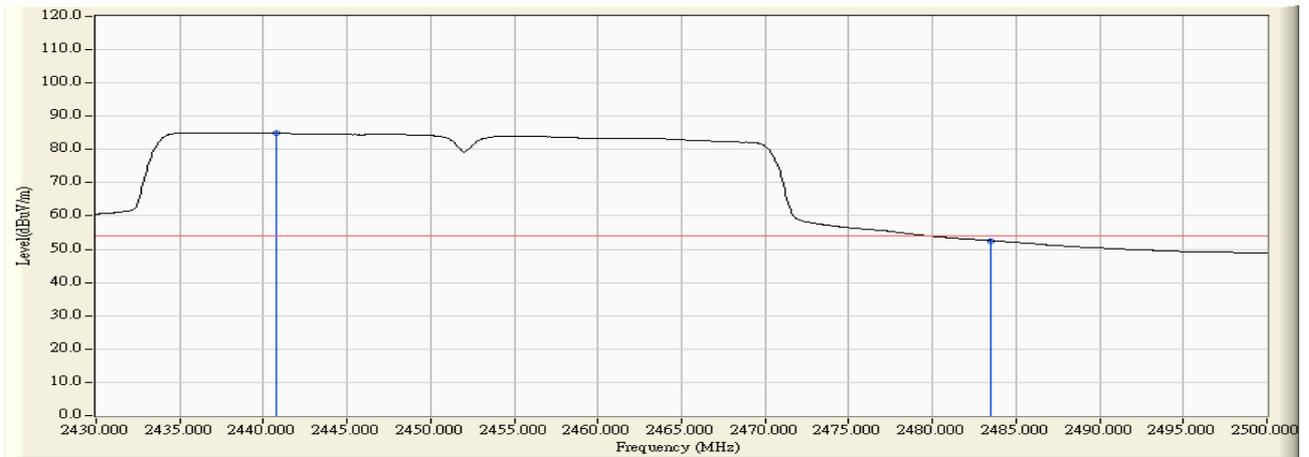
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	31.184	21.322	52.506	-1.464	53.970	AVERAGE
2	*	2413.220	31.192	54.148	85.339	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:36
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2452MHz



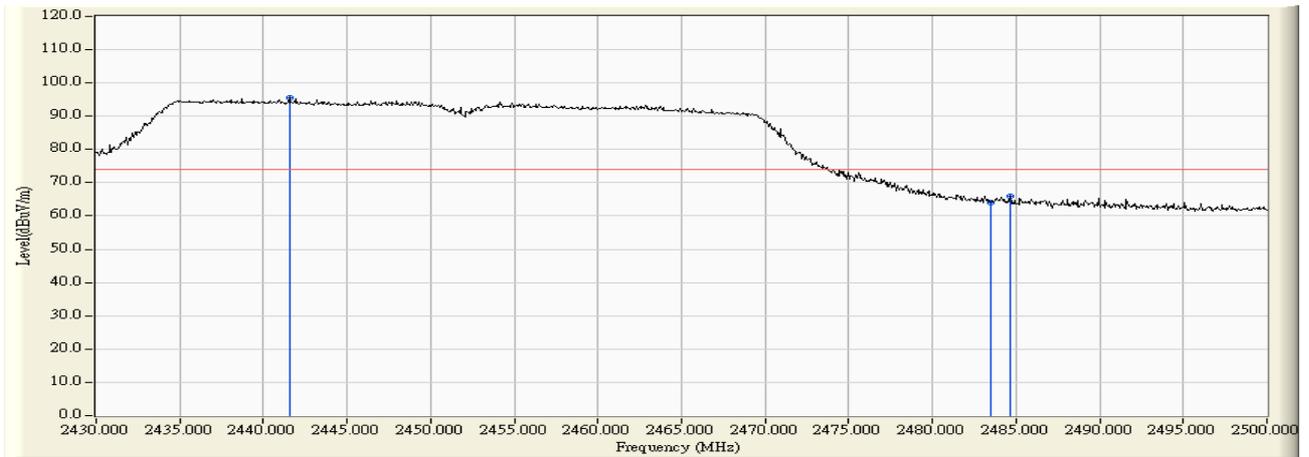
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2438.330	31.213	65.981	97.194	N/A	N/A	PEAK
2		2483.500	31.212	34.149	65.361	-8.609	73.970	PEAK

<b>Engineer : Robin</b>	
<b>Site : AC-5 (3m Semi-Anechoic Chamber)</b>	<b>Time : 2009/05/15 - 15:37</b>
<b>Limit : FCC_SpartC_15.209_03M_AV</b>	<b>Margin : 0</b>
<b>EUT : HSPA/ Wi-Fi Module</b>	<b>Probe : 9120D_499(1-18GHz) - HORIZONTAL</b>
<b>Power : AC 120V/60Hz</b>	<b>Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2452MHz</b>



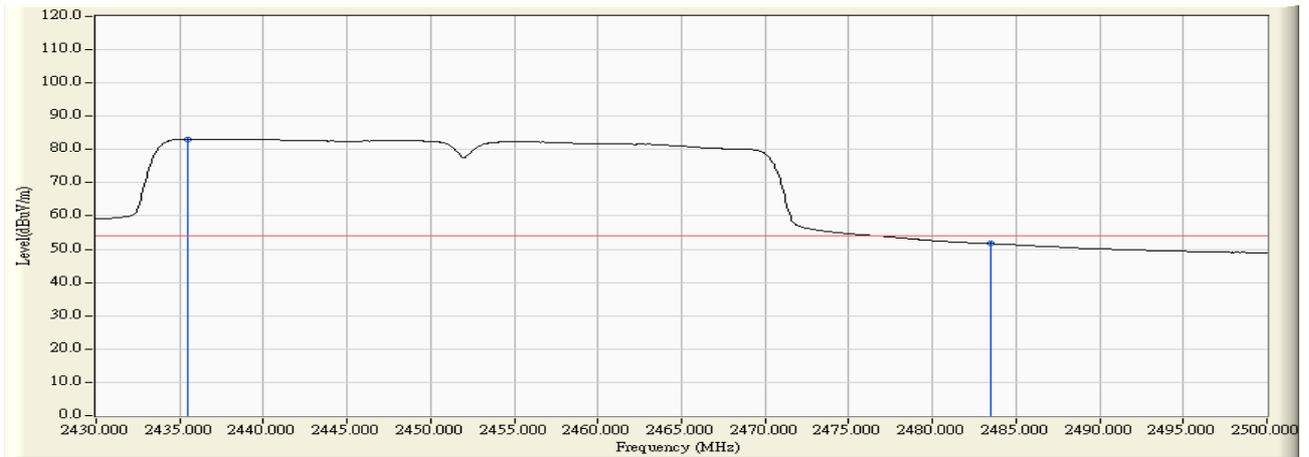
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2440.780	31.214	53.781	84.996	N/A	N/A	AVERAGE
2		2483.500	31.212	21.383	52.595	-1.375	53.970	AVERAGE

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:39
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2452MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2441.550	31.216	64.375	95.591	N/A	N/A	PEAK
2		2483.500	31.212	32.942	64.154	-9.816	73.970	PEAK
3		2484.670	31.212	34.734	65.945	-8.025	73.970	PEAK

Engineer : Robin	
Site : AC-5 (3m Semi-Anechoic Chamber)	Time : 2009/05/15 - 15:40
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : HSPA/ Wi-Fi Module	Probe : 9120D_499(1-18GHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 4: Transmit by 802.11n(40MHz) at channel 2452MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2435.460	31.211	51.841	83.051	N/A	N/A	AVERAGE
2		2483.500	31.212	20.481	51.693	-2.277	53.970	AVERAGE

## 7. Operation Frequency Range of 20dB Bandwidth

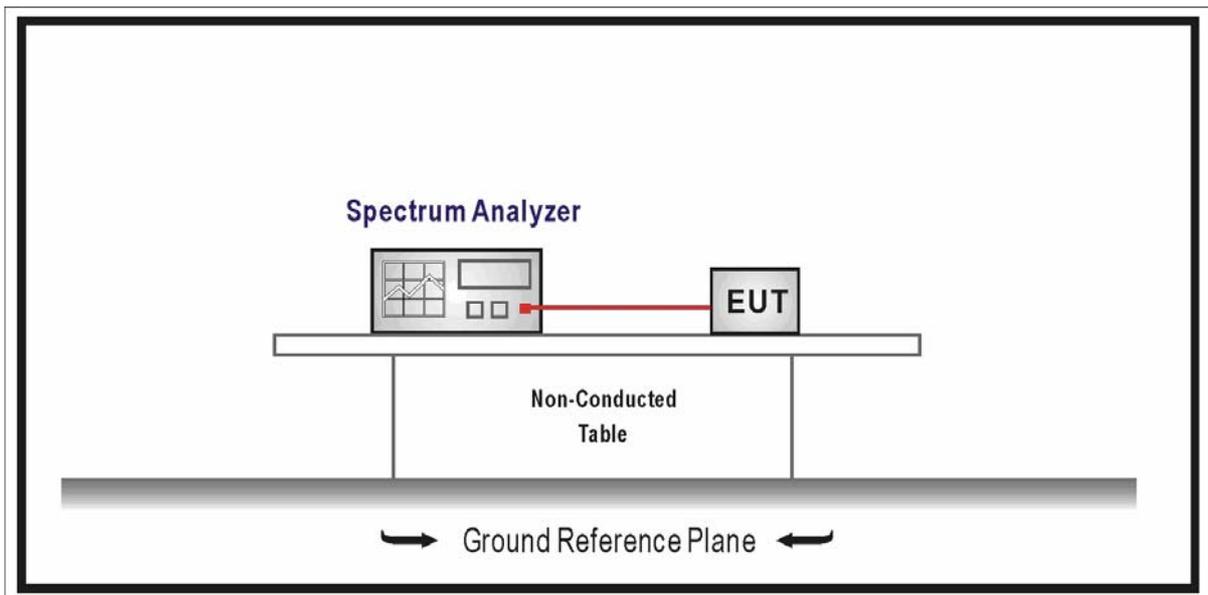
### 7.1. Test Equipment

Operation Frequency Range of 20dB Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2009/06/11
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	AC6-RF1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC6-TH	2009.03.31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 7.2. Test Setup



### 7.3. Limit

20 dB bandwidth of the emission is contained within the operation frequency band.

### 7.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

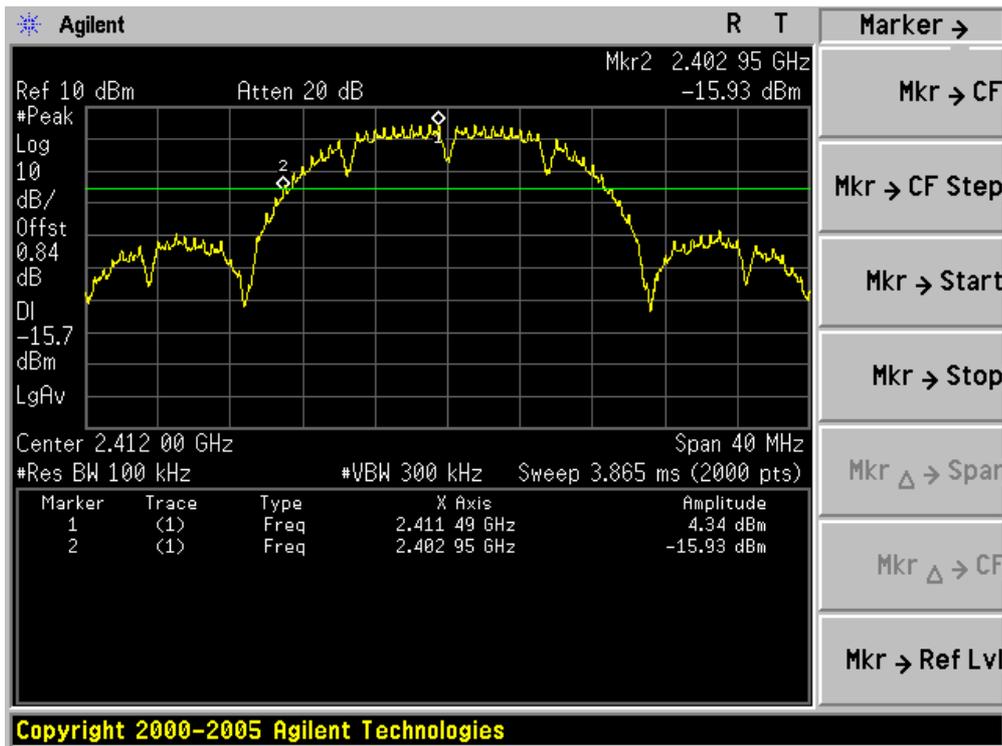
## 7.5. Uncertainty

The measurement uncertainty is defined as  $\pm 1$  kHz

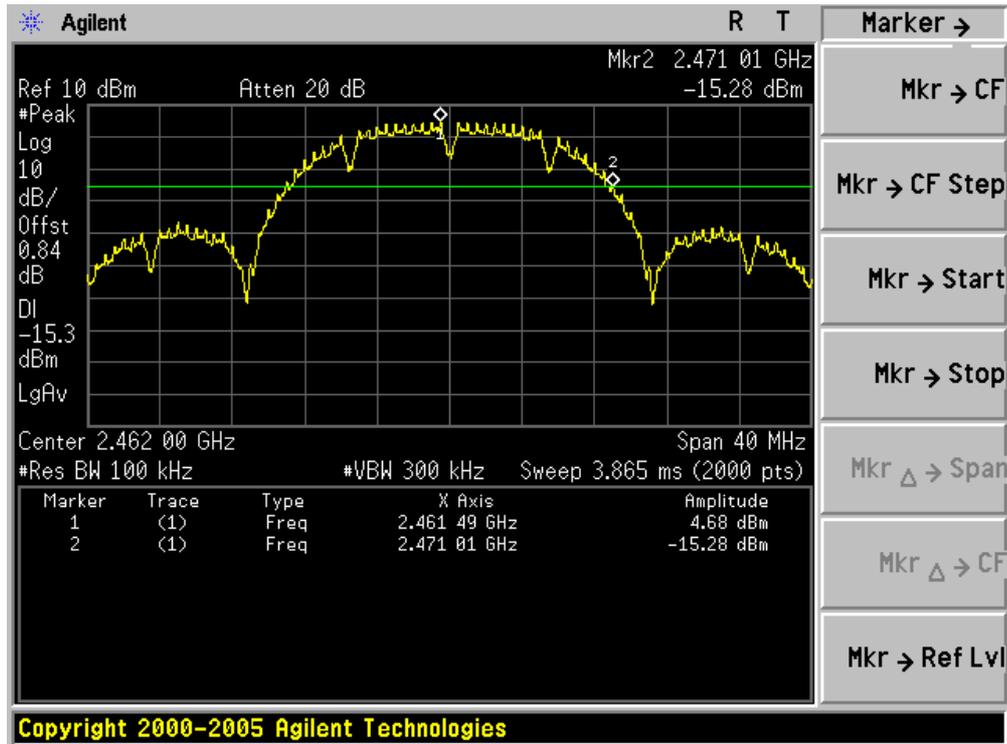
7.6. Test Result

Product	:	HSPA/ Wi-Fi Module
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	AC-6
Test Mode	:	Mode 1: Transmit by 802.11b

Channel 01 (2412MHz)

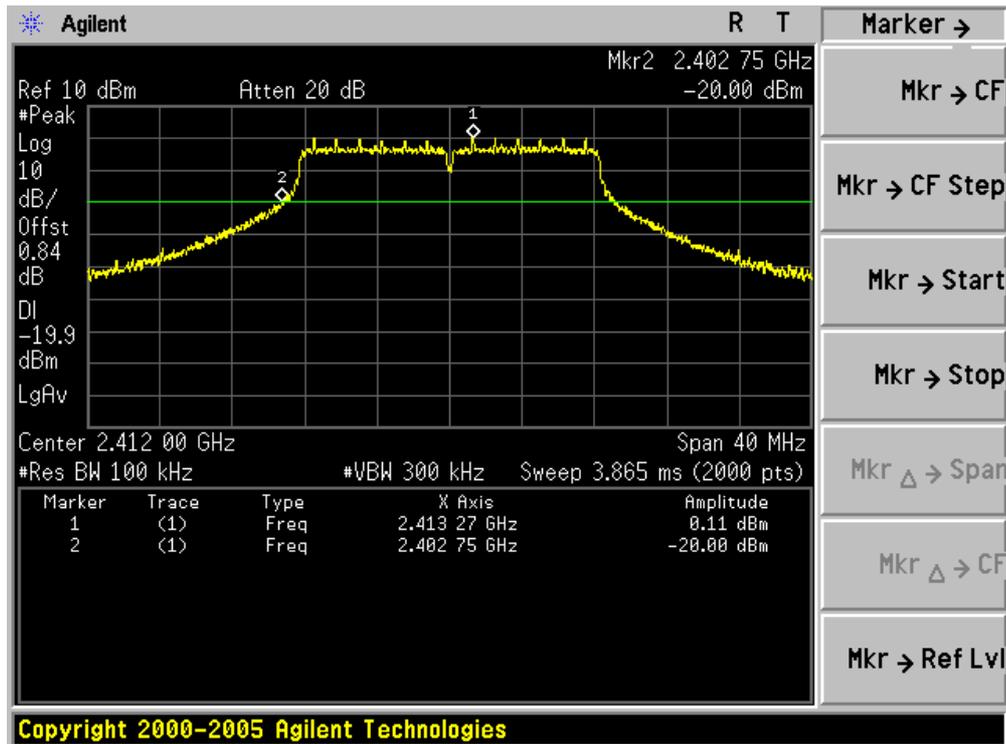


Channel 11 (2462MHz)

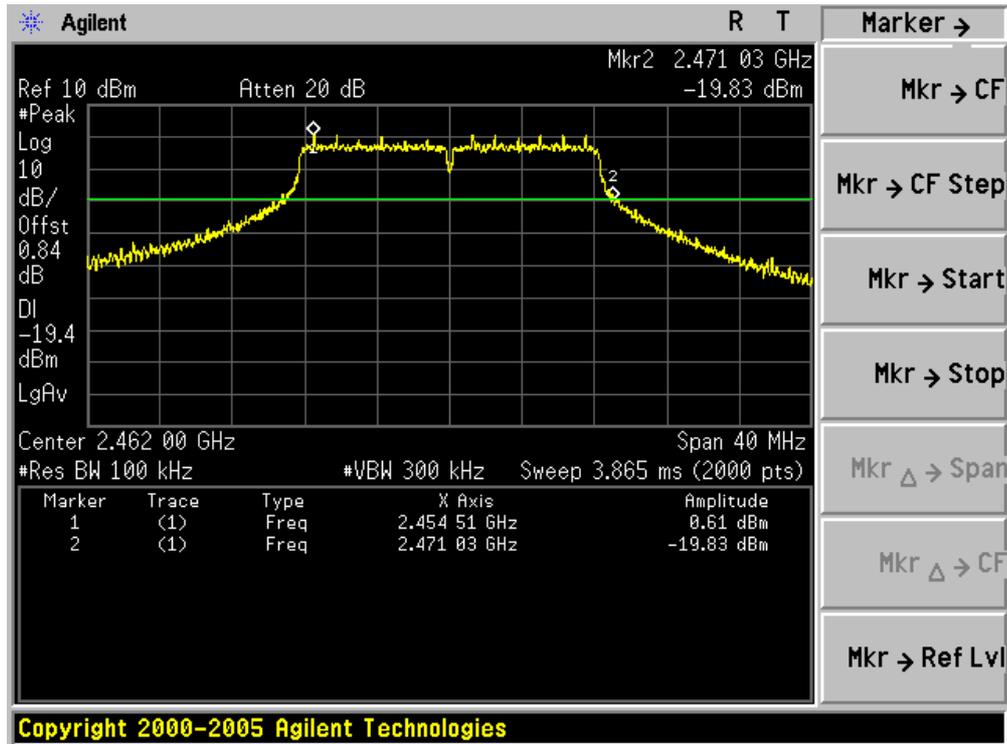


Product	: HSPA/ Wi-Fi Module
Test Item	: Operation Frequency Range of 20dB Bandwidth
Test Site	: AC-6
Test Mode	: Mode 2: Transmit by 802.11g

### Channel 01 (2412MHz)

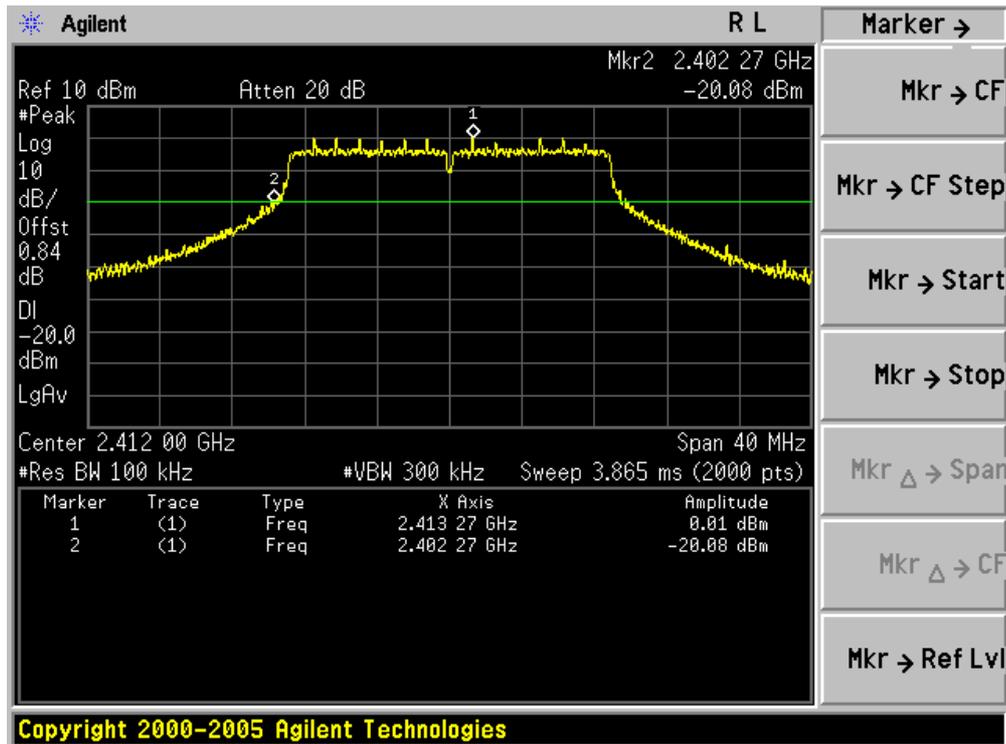


Channel 11 (2462MHz)

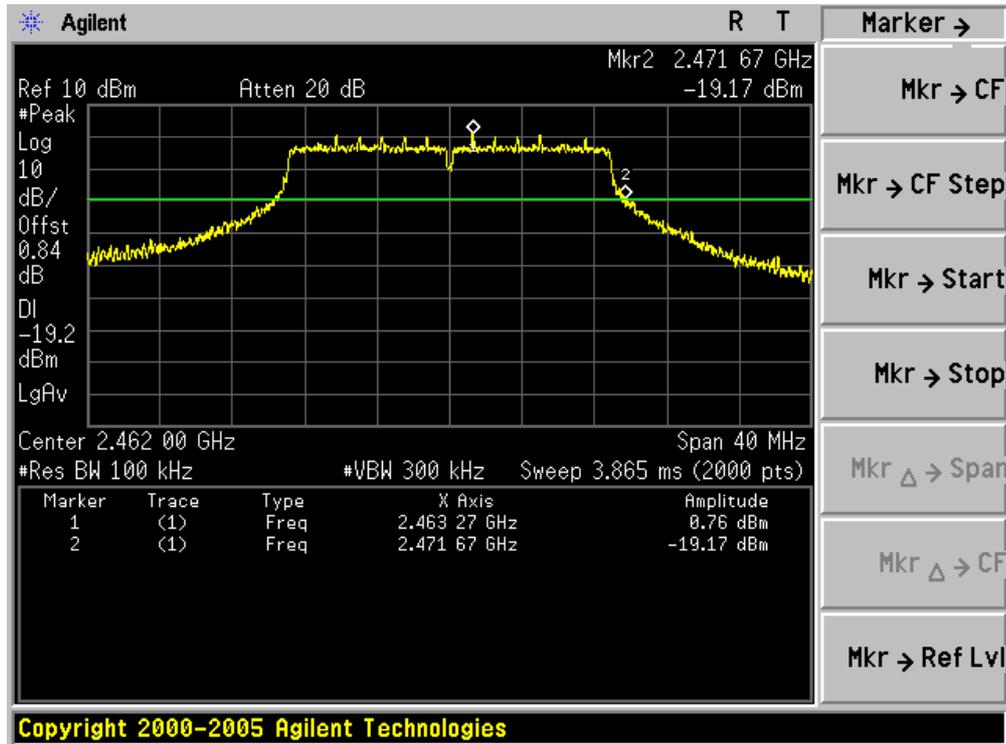


Product	: HSPA/ Wi-Fi Module
Test Item	: Operation Frequency Range of 20dB Bandwidth
Test Site	: AC-6
Test Mode	: Mode 3: Transmit by 802.11n(20MHz)

### Channel 01 (2412MHz)

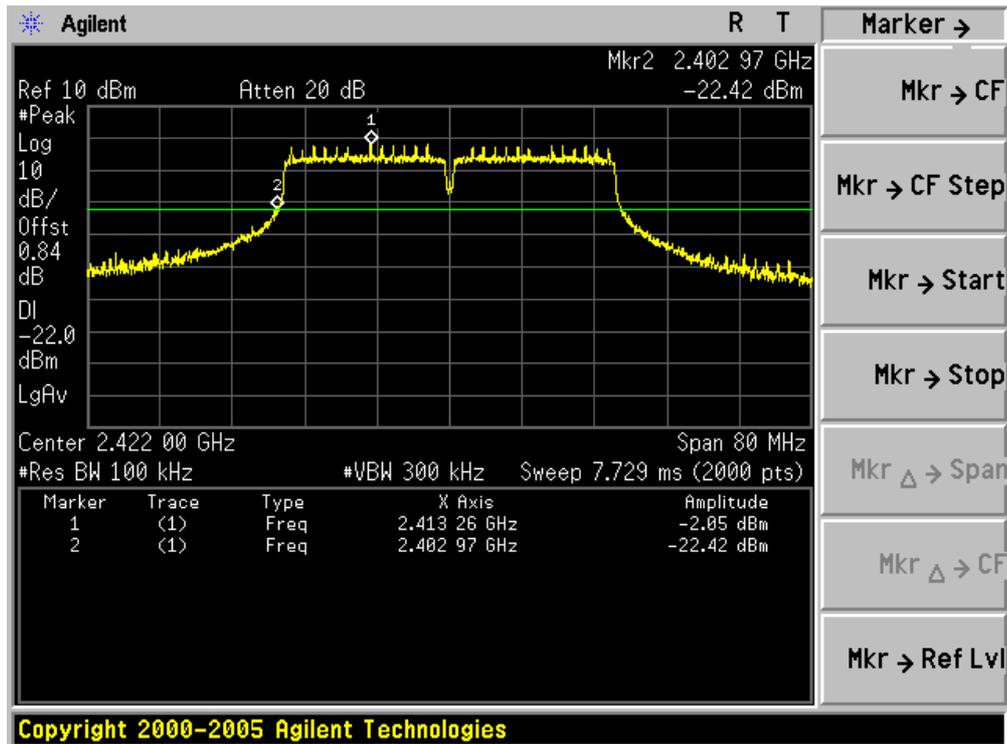


Channel 11 (2462MHz)

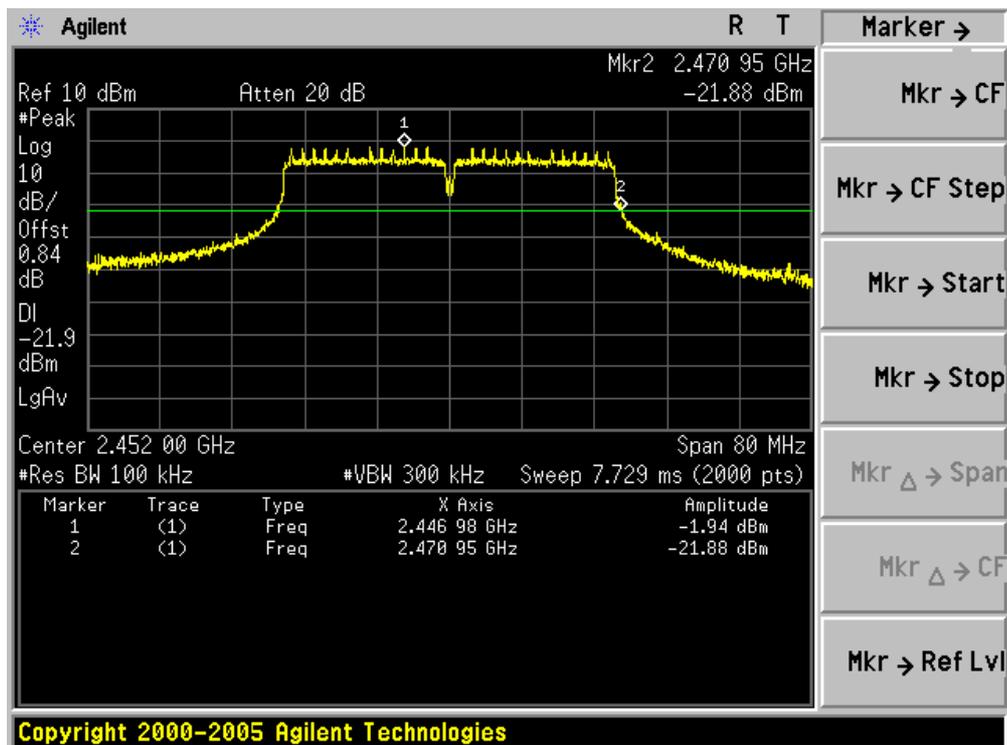


Product	: HSPA/ Wi-Fi Module
Test Item	: Operation Frequency Range of 20dB Bandwidth
Test Site	: AC-6
Test Mode	: Mode 4: Transmit by 802.11n(40MHz)

### Channel 03 (2422MHz)



Channel 09 (2452MHz)



## 8. Occupied Bandwidth

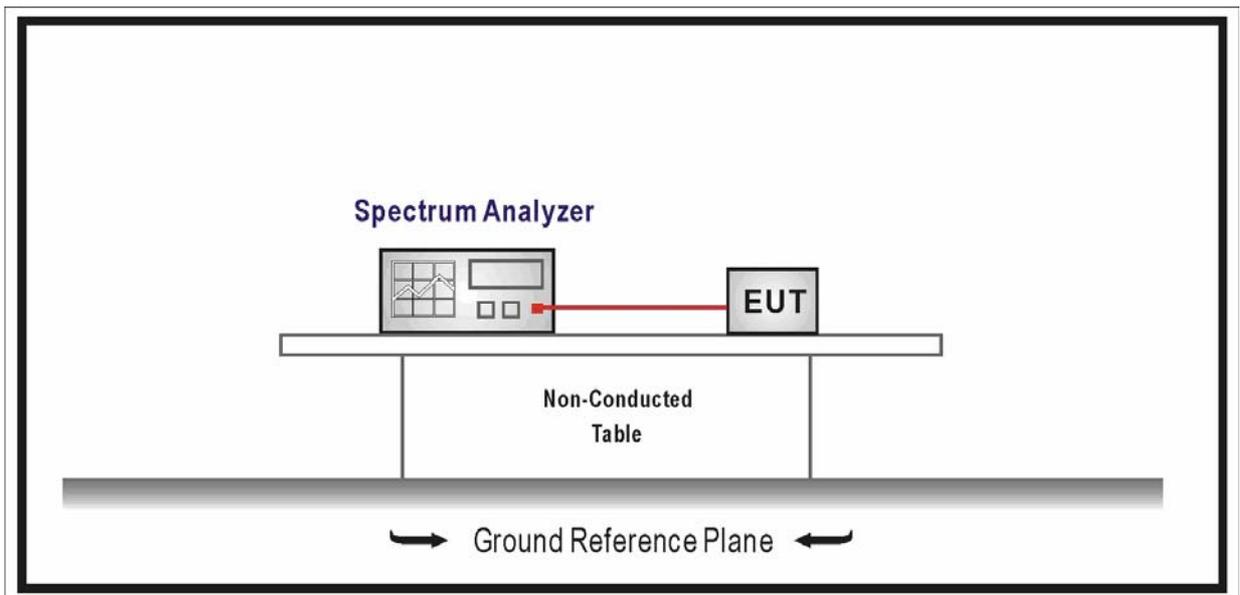
### 8.1. Test Equipment

Occupied Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2009/06/11
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	AC6-RF1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC6-TH	2009.03.31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 8.2. Test Setup



### 8.3. Limit

The minimum 6 dB bandwidth shall be at least 500 kHz.

### 8.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

**8.5. Uncertainty**

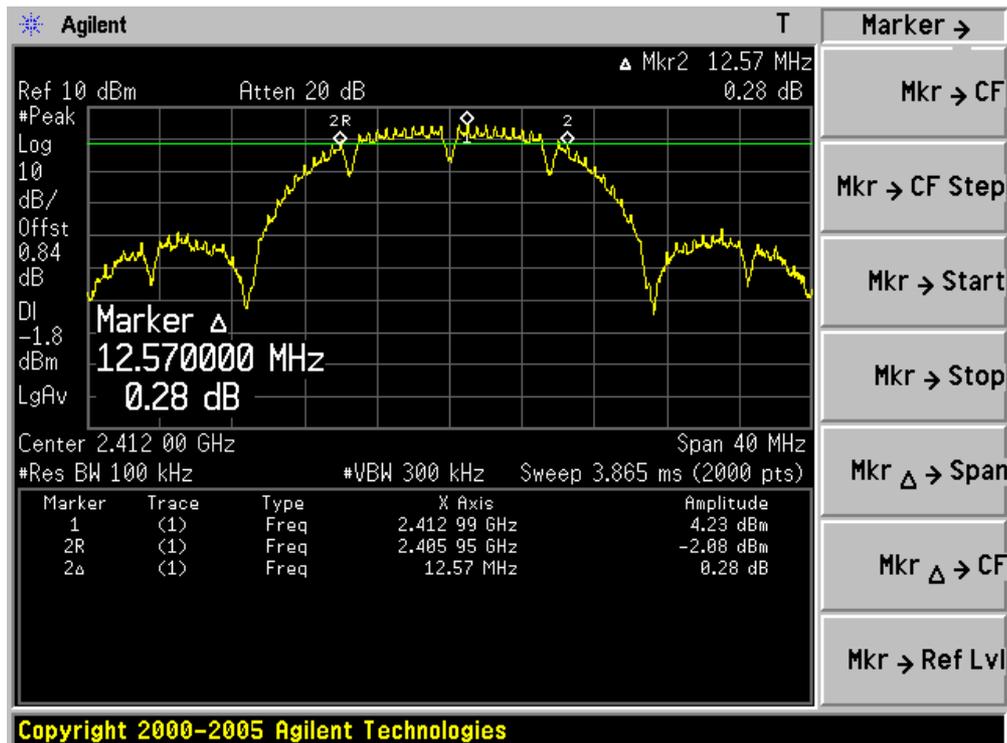
The measurement uncertainty is defined as  $\pm 1$  kHz

8.6. Test Result

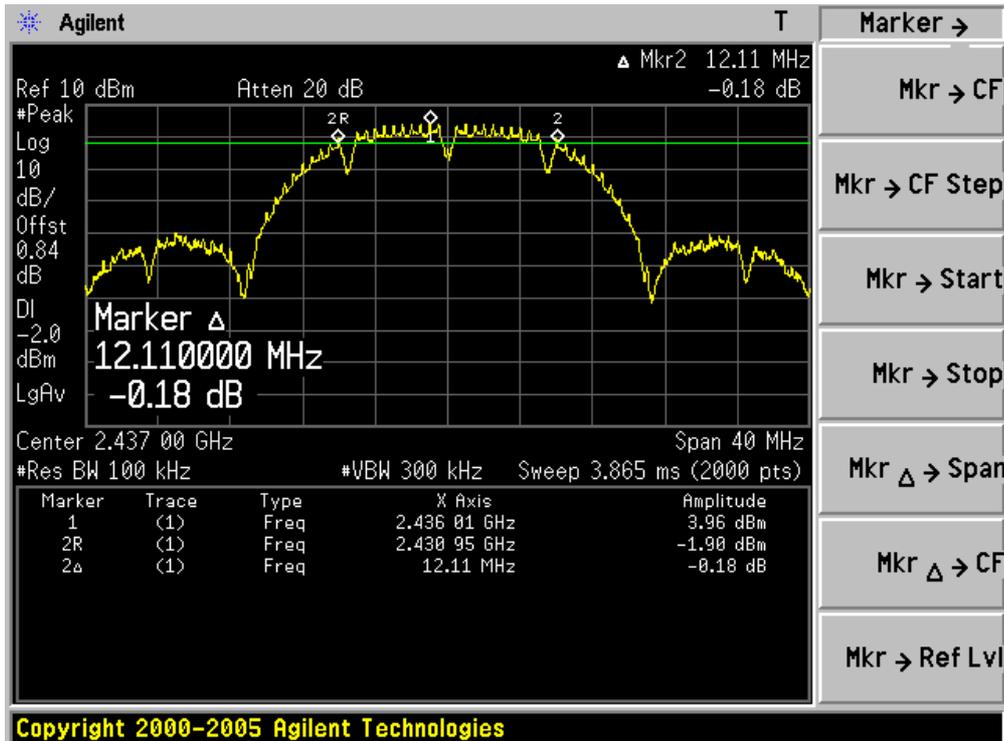
Product	:	HSPA/ Wi-Fi Module
Test Item	:	Occupied Bandwidth
Test Site	:	AC-6
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	12570	500	Pass
06	2437	12110	500	Pass
11	2462	12090	500	Pass

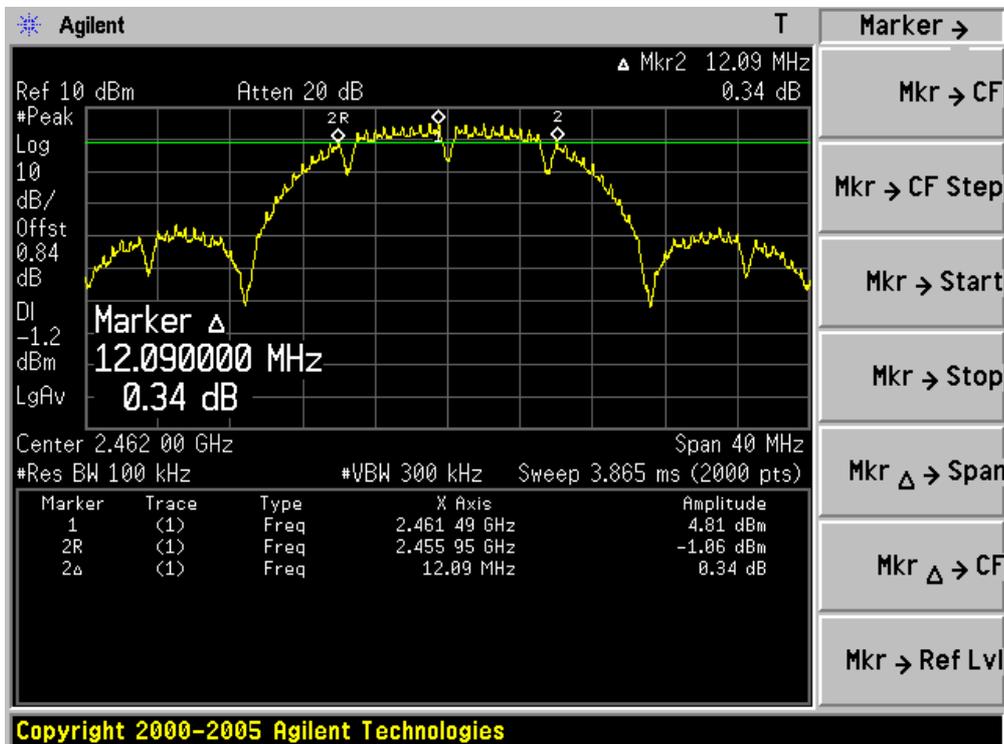
Channel 01 (2412MHz)



Channel 06 (2437MHz)



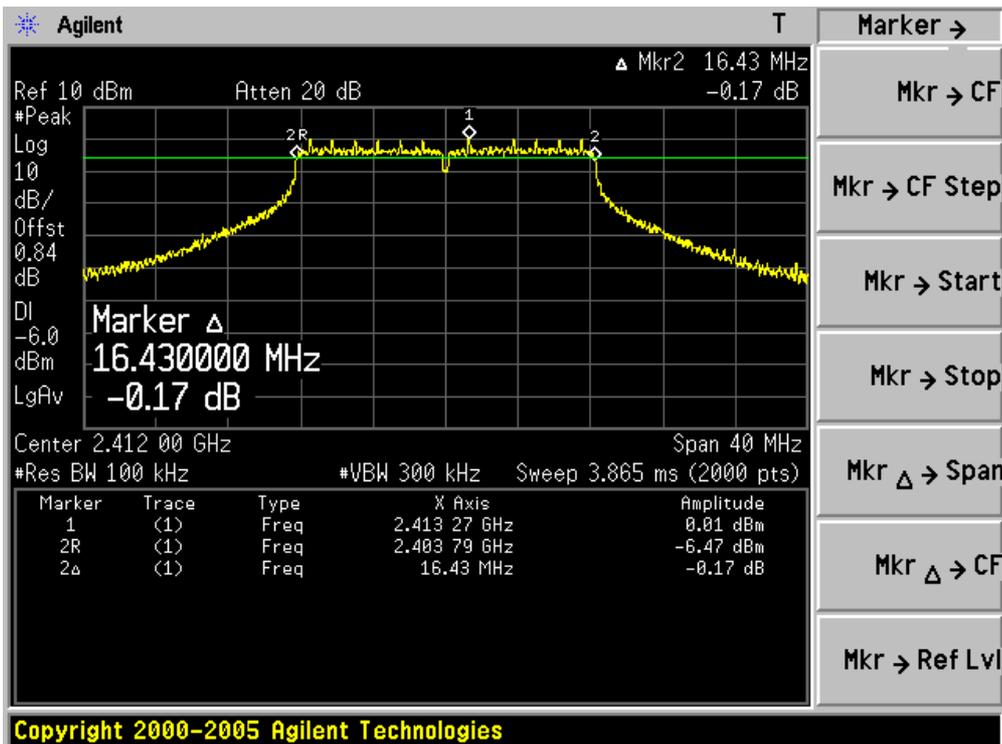
Channel 11 (2462MHz)



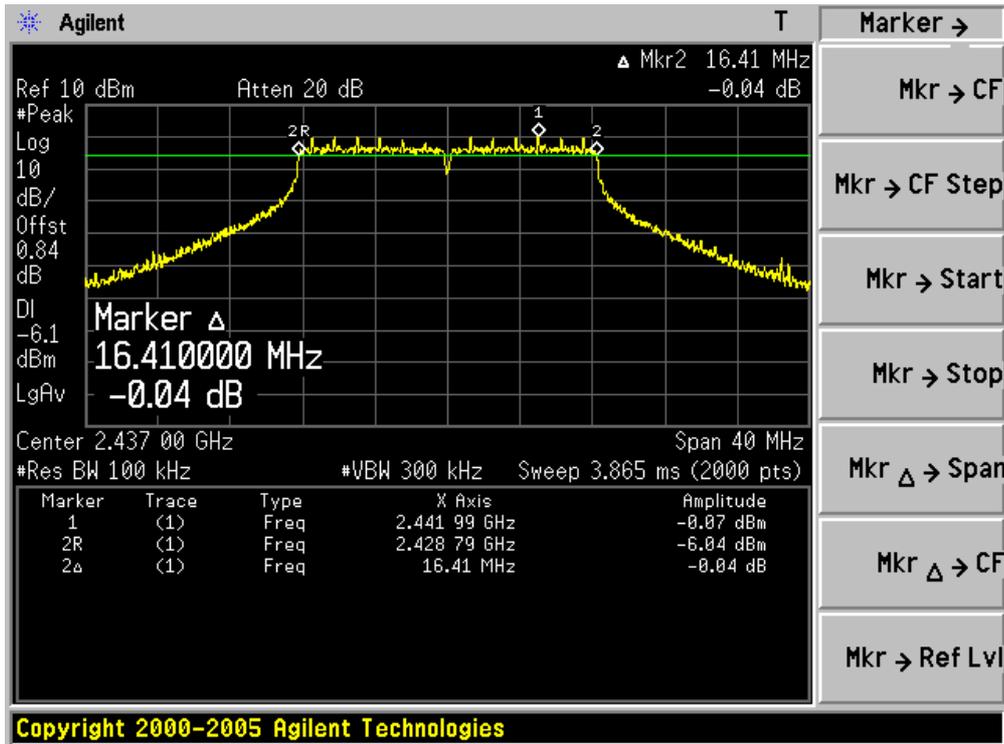
Product	: HSPA/ Wi-Fi Module
Test Item	: Occupied Bandwidth
Test Site	: AC-6
Test Mode	: Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	16430	500	Pass
06	2437	16410	500	Pass
11	2462	16410	500	Pass

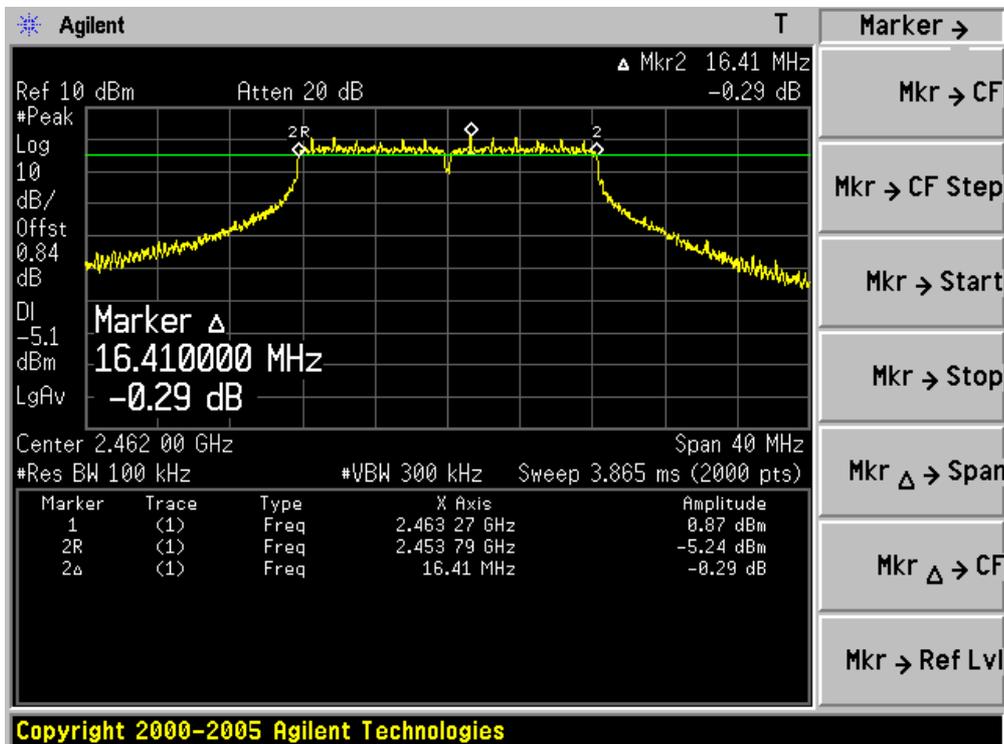
Channel 01 (2412MHz)



Channel 06 (2437MHz)



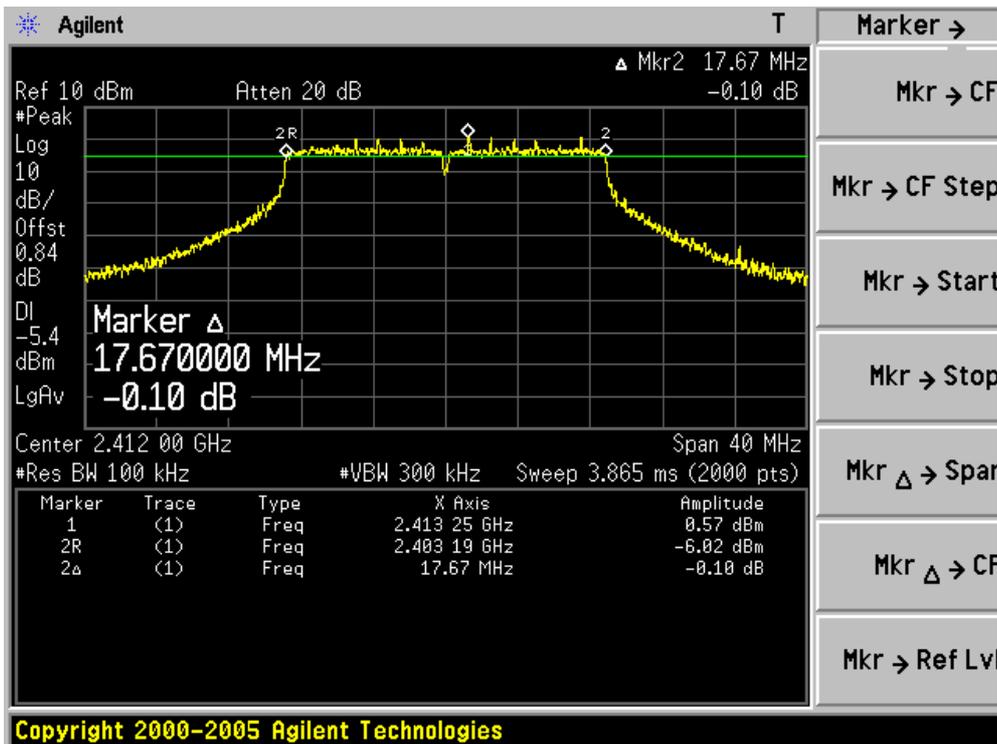
Channel 11 (2462MHz)



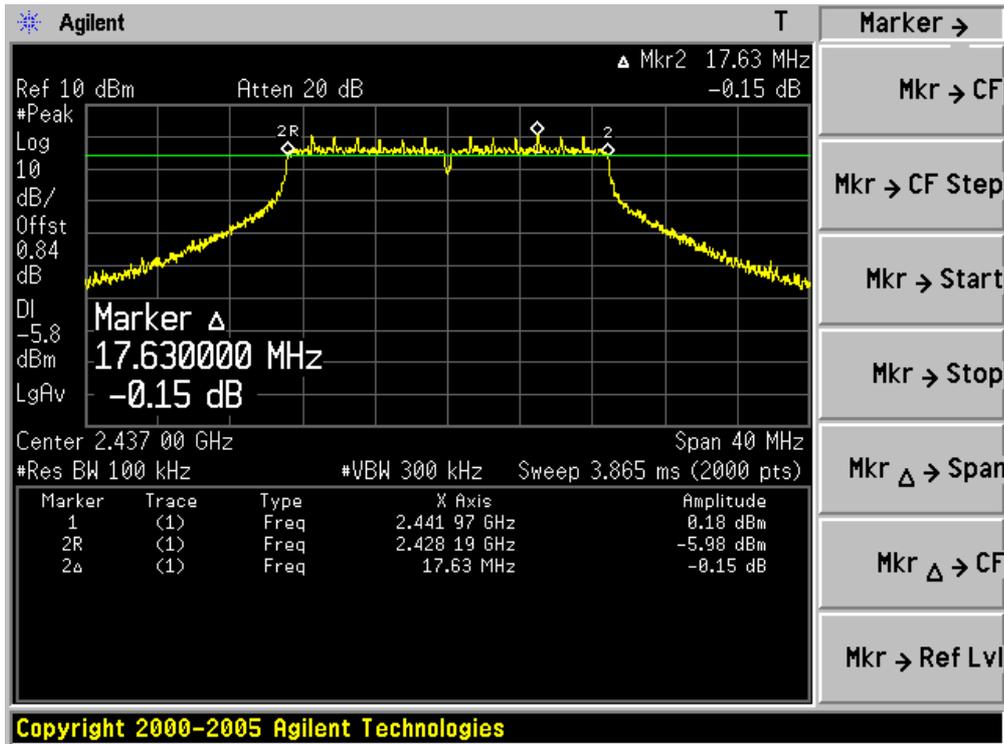
Product	:	HSPA/ Wi-Fi Module
Test Item	:	Occupied Bandwidth
Test Site	:	AC-6
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	17670	500	Pass
06	2437	17630	500	Pass
11	2462	17630	500	Pass

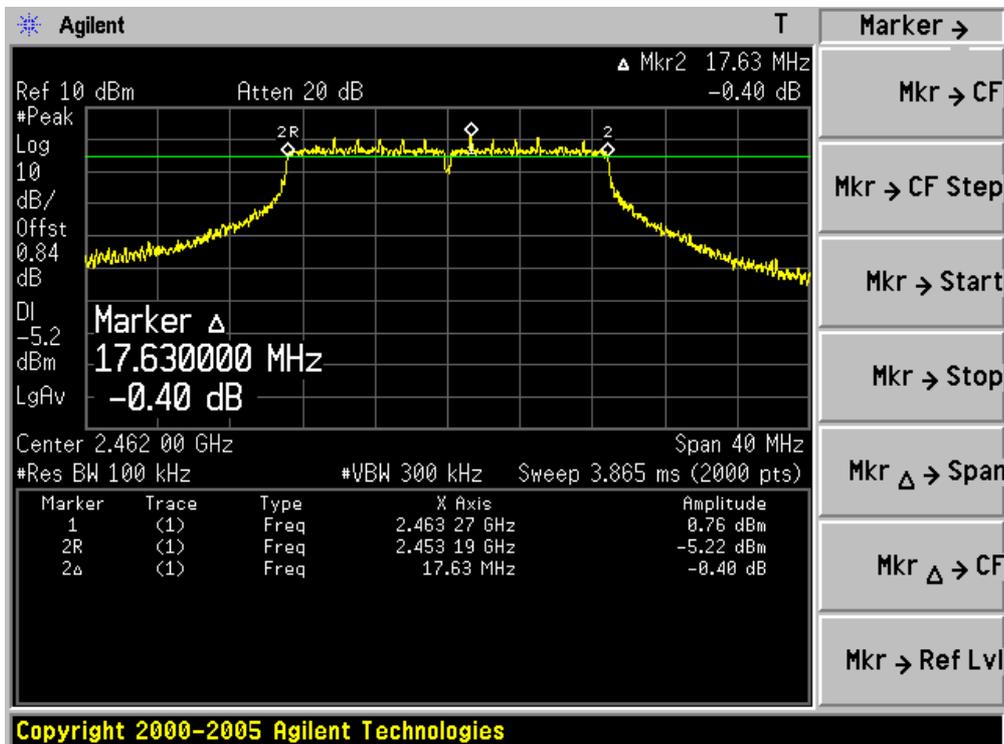
Channel 01 (2412MHz)



Channel 06 (2437MHz)



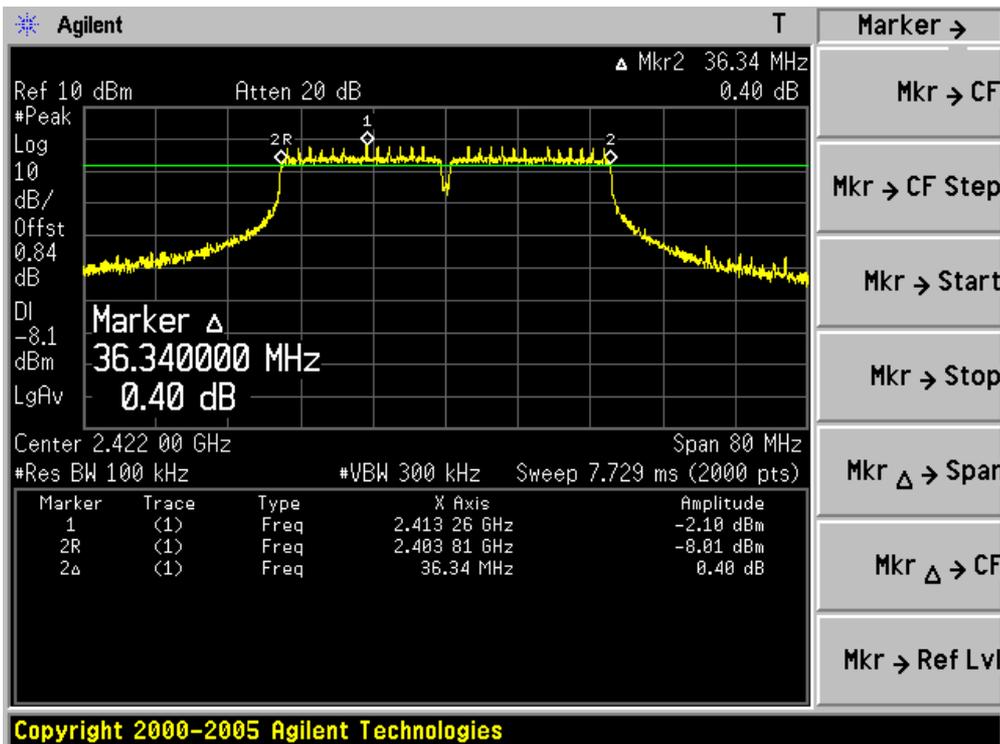
Channel 11 (2462MHz)



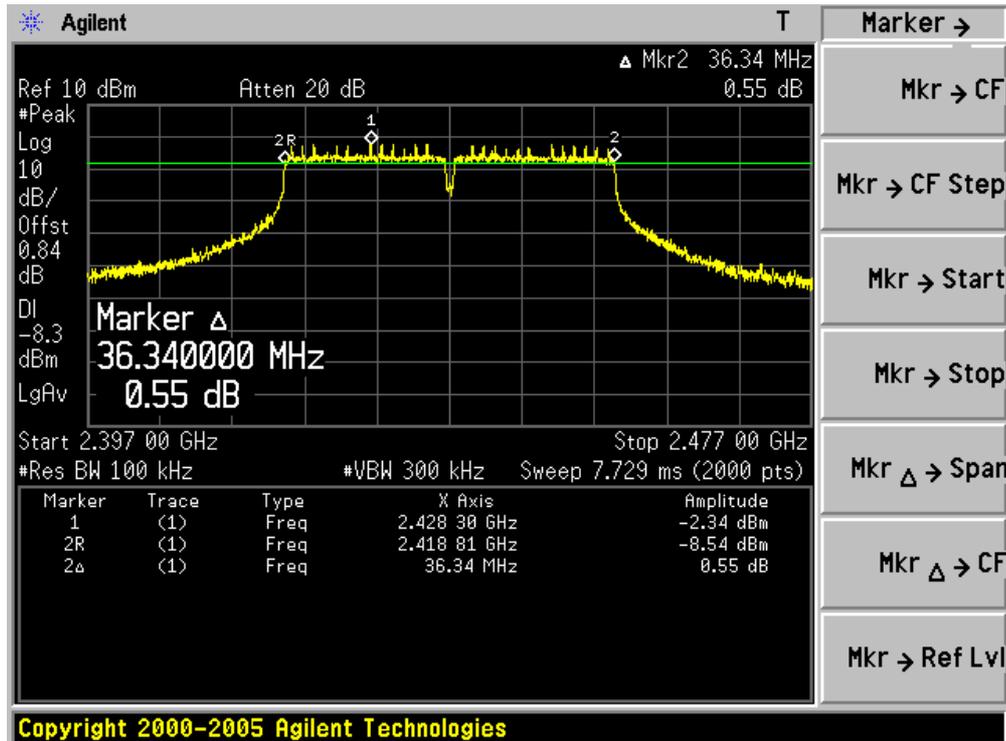
Product	: HSPA/ Wi-Fi Module
Test Item	: Occupied Bandwidth
Test Site	: AC-6
Test Mode	: Mode 4: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
03	2422	36340	500	Pass
06	2437	36340	500	Pass
09	2452	36380	500	Pass

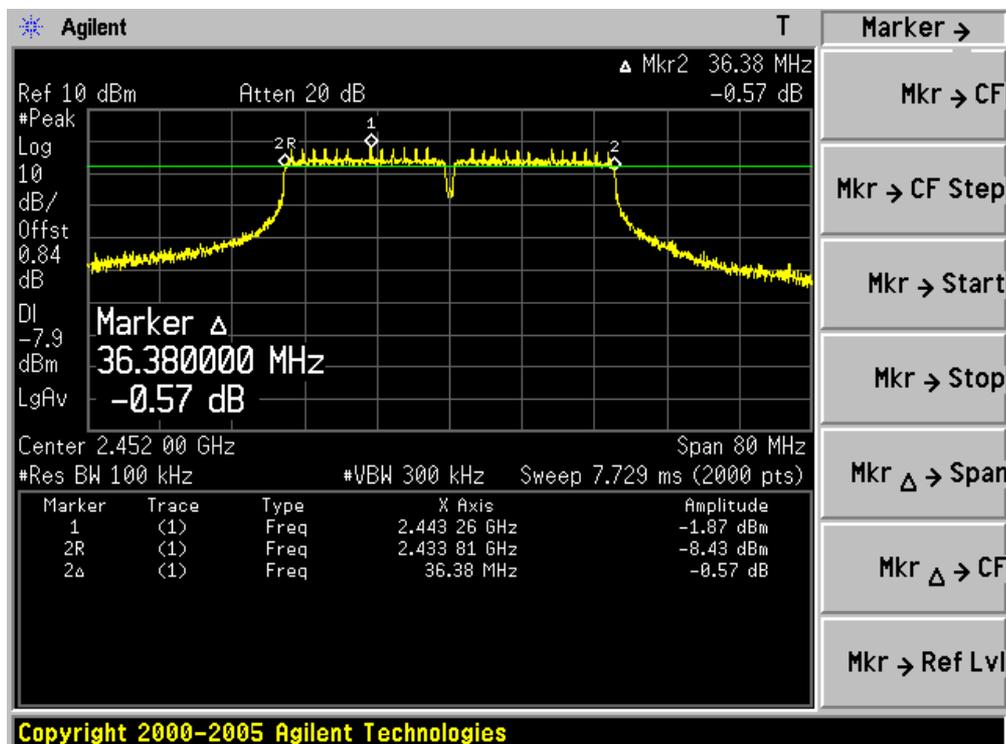
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



## 9. Power Output

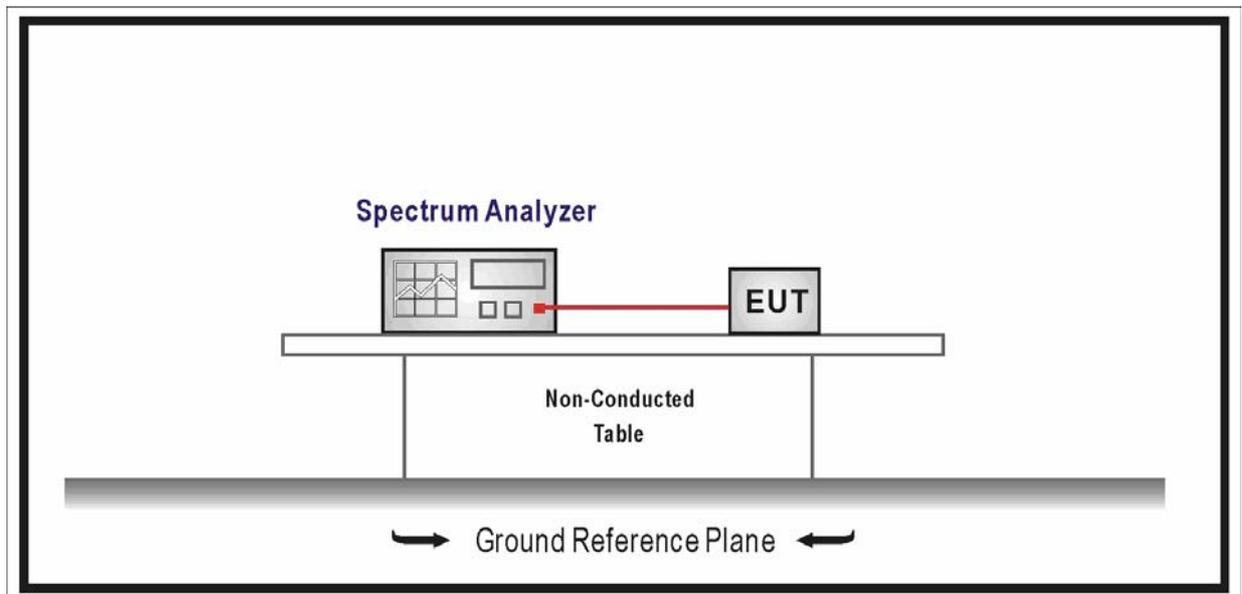
### 9.1. Test Equipment

Power Output / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2009/02/12
Power Sensor	Anritsu	MA2411B	0846014	2009/01/12
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	AC6-RF1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC6-TH	2009.03.31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 9.2. Test Setup



### 9.3. Limit

The maximum peak power shall be less 1 Watt (30dBm).

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

#### 9.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Power output measurement allowed per Section 15.247(b)(3).

Use the wideband power meter to test peak power and record the result.

#### 9.5. Uncertainty

The measurement uncertainty is defined as  $\pm 1.27$  dB

**9.6. Test Result**

Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Output
Test Site	:	AC-6
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Data Rate (Mbps)				Limit (dBm)
		1	2	5.5	11	
01	2412	19.41	--	--	--	30
06	2437	19.16	19.04	18.92	18.85	30
11	2462	19.43	--	--	--	30

Note: The antenna gain of transmitter is less than 6 dBi and other than fixed, point-to-point operation, therefore the limit is 30 dBm.

Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Output
Test Site	:	AC-6
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Data Rate (Mbps)								Limit (dBm)
		6	9	12	18	24	36	48	54	
01	2412	17.83	--	--	--	--	--	--	--	30
06	2437	17.50	17.37	17.16	17.00	16.87	16.72	16.59	16.43	30
11	2462	18.03	--	--	--	--	--	--	--	30

Note: The antenna gain of transmitter is less than 6 dBi and other than fixed, point-to-point operation, therefore the limit is 30 dBm.

Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Output
Test Site	:	AC-6
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Data Rate (Mbps)								Limit (dBm)
		6.5	13	19.5	26	39	52	58.5	65	
01	2412	17.65	--	--	--	--	--	--	--	30
06	2437	17.78	17.70	17.58	17.46	17.33	17.19	17.02	16.95	30
11	2462	18.39	--	--	--	--	--	--	--	30

Note: The antenna gain of transmitter is less than 6 dBi and other than fixed, point-to-point operation, therefore the limit is 30 dBm.

Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Output
Test Site	:	AC-6
Test Mode	:	Mode 4: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	Data Rate (Mbps)								Limit (dBm)
		13.5	27	40.5	54	81	108	121.5	135	
03	2422	18.22	--	--	--	--	--	--	--	30
06	2437	18.04	17.92	17.78	17.64	17.50	17.38	17.22	17.10	30
09	2452	18.34	--	--	--	--	--	--	--	30

Note: The antenna gain of transmitter is less than 6 dBi and other than fixed, point-to-point operation, therefore the limit is 30 dBm.

## 10. Power Spectral Density

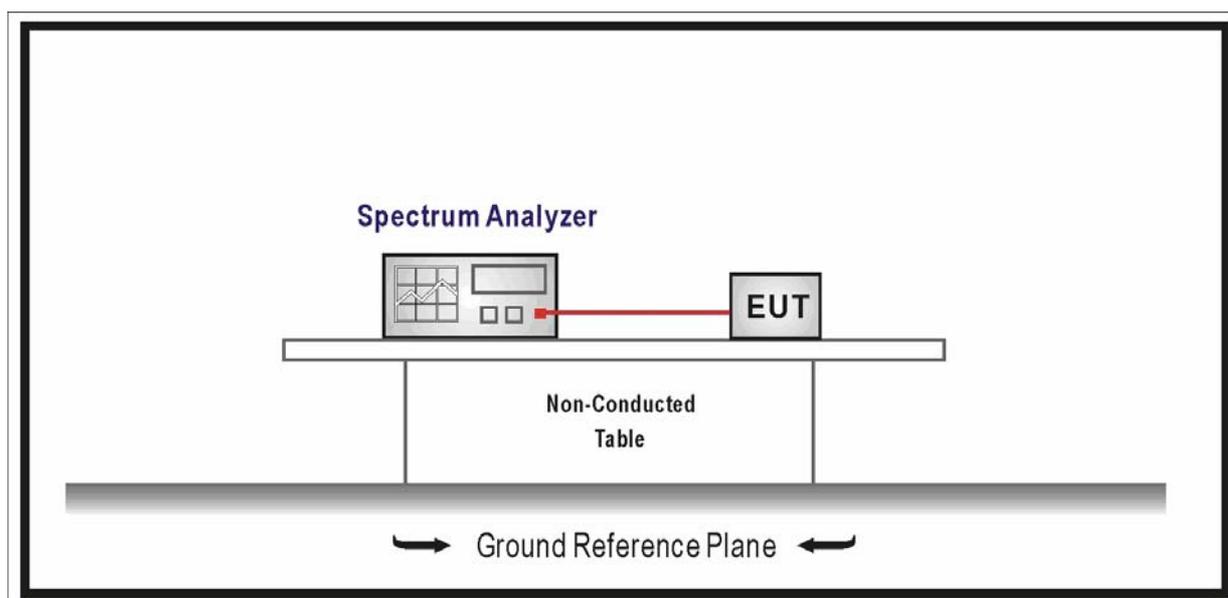
### 10.1. Test Equipment

Power Spectral Density / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2009/06/11
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	AC6-RF1	2009.05.25
Temperature/Humidity Meter	zhicheng	ZC1-2	AC6-TH	2009.03.31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 10.2. Test Setup



### 10.3. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiated to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

### 10.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, Set VBW  $\cong$  9 kHz, Sweep time=Auto, Set detector=Peak detector.

### **10.5. Uncertainty**

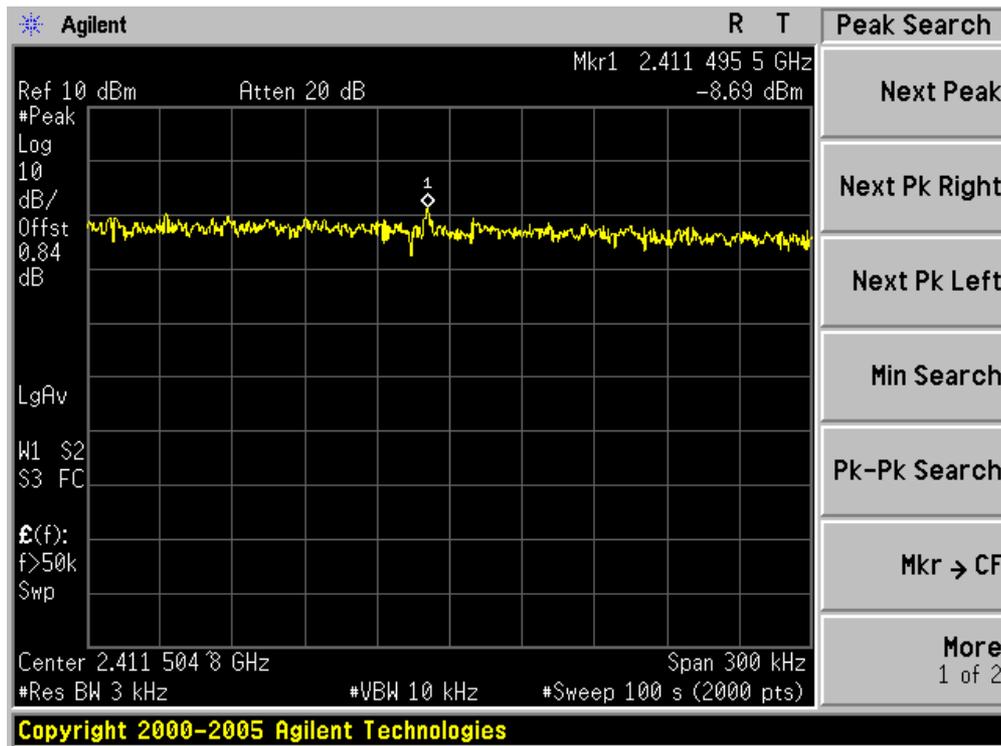
The measurement uncertainty is defined as  $\pm 1.27$  dB

10.6. Test Result

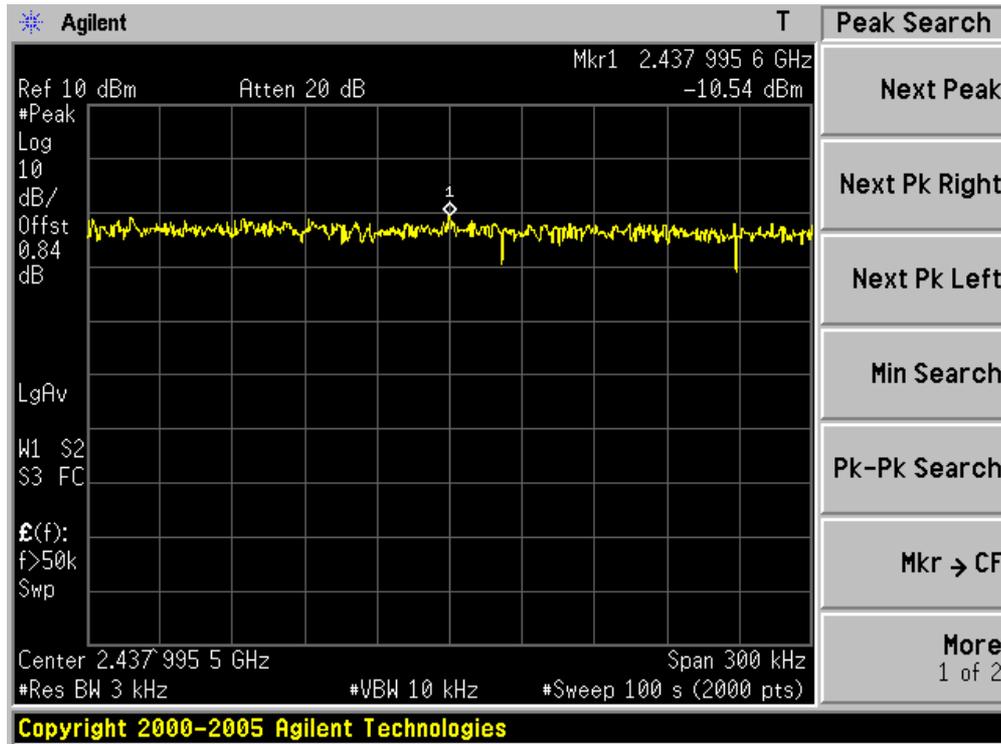
Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Spectral Density
Test Site	:	AC-6
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-8.69	8	Pass
06	2437	-10.54	8	Pass
11	2462	-9.88	8	Pass

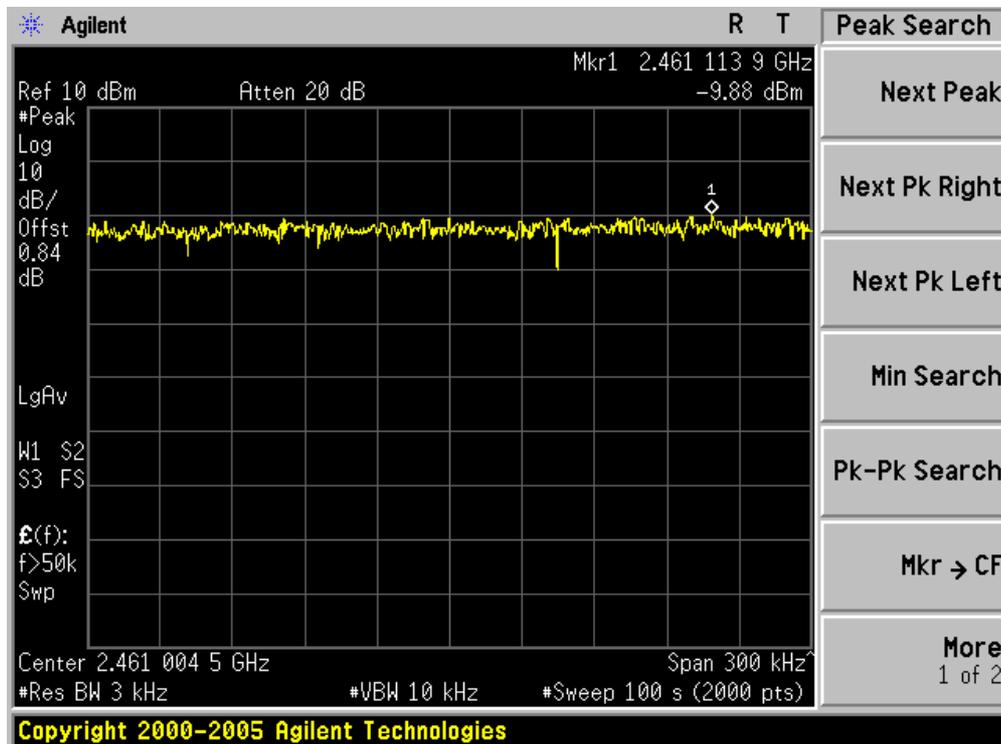
Channel 01 (2412MHz)



Channel 06 (2437MHz)



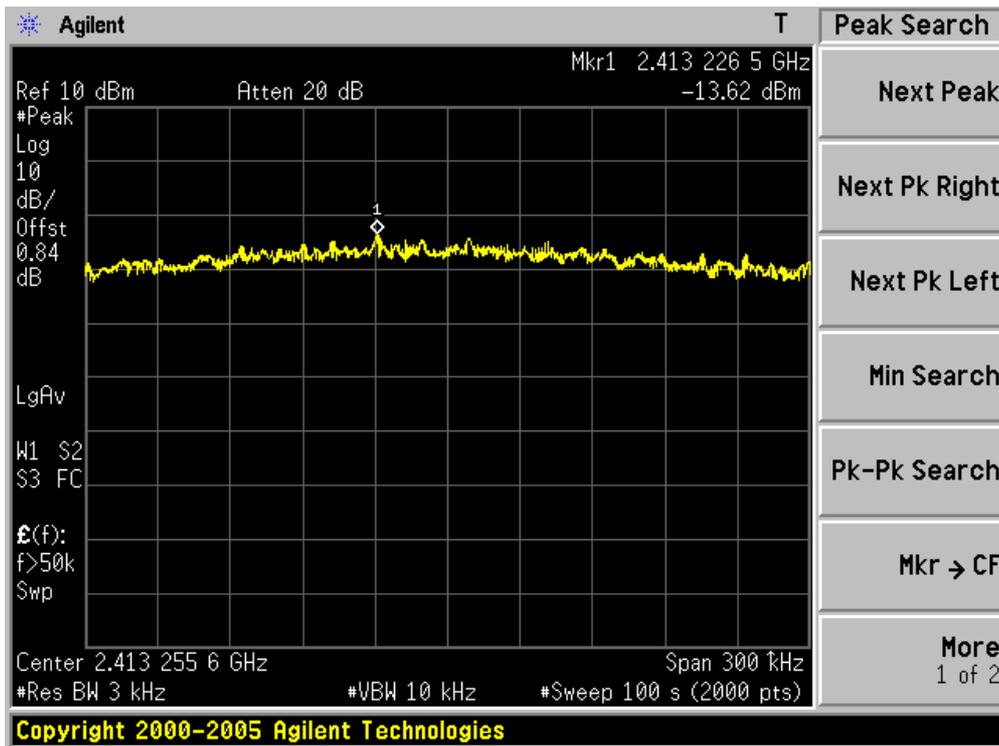
Channel 11 (2462MHz)



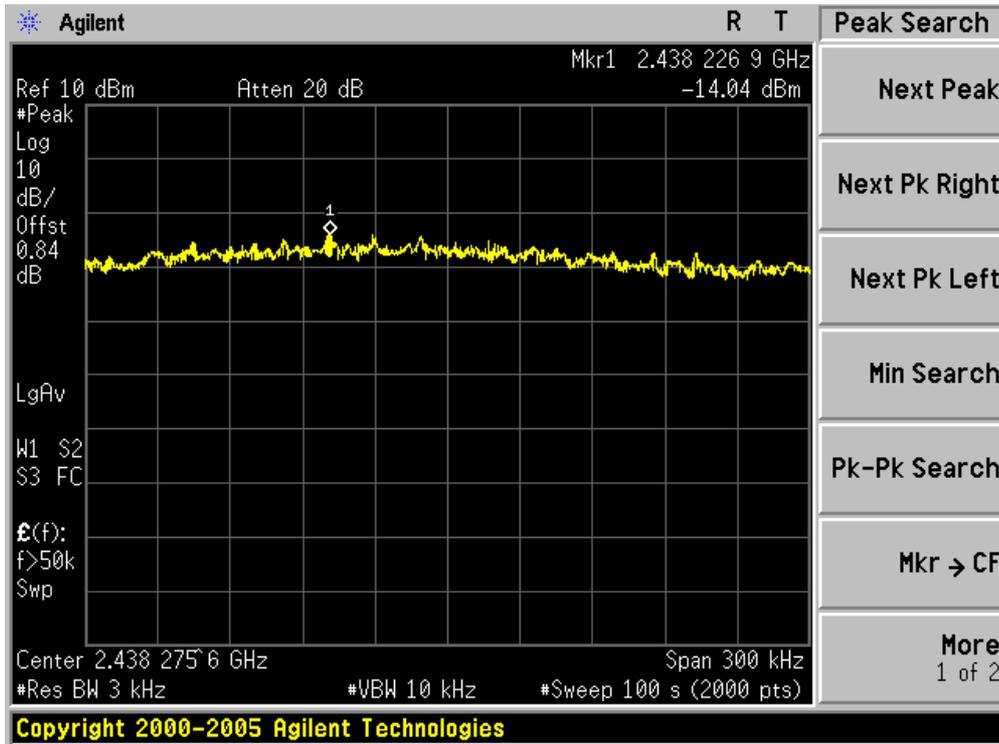
Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Spectral Density
Test Site	:	AC-6
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-13.62	8	Pass
06	2437	-14.04	8	Pass
11	2462	-13.04	8	Pass

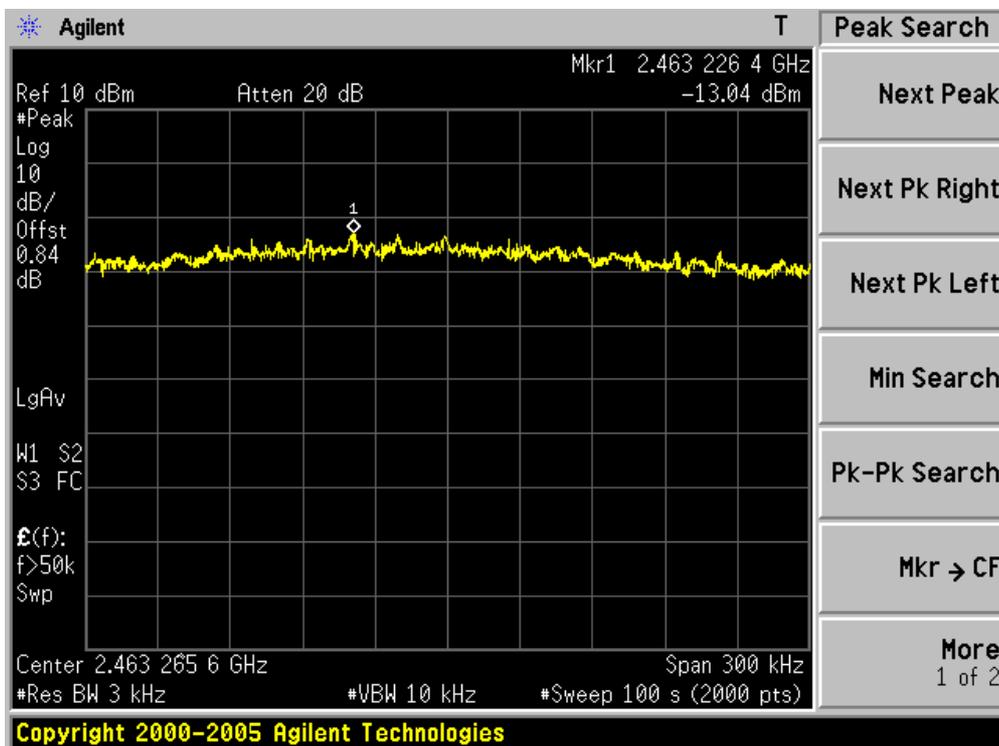
**Channel 01 (2412MHz)**



Channel 06 (2437MHz)



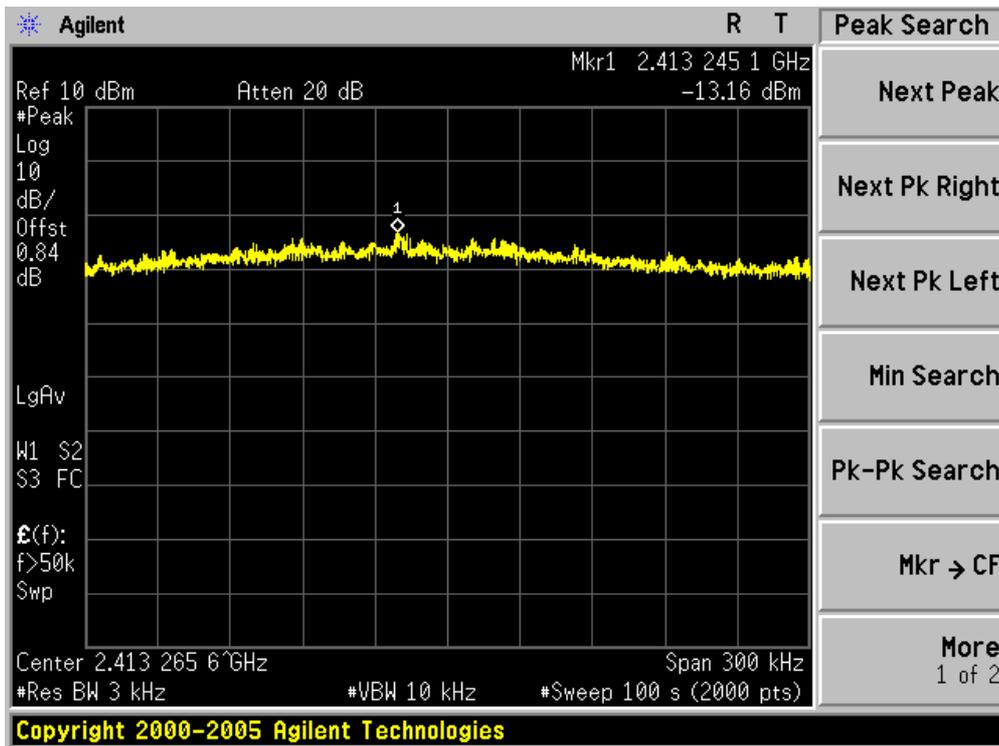
Channel 11 (2462MHz)



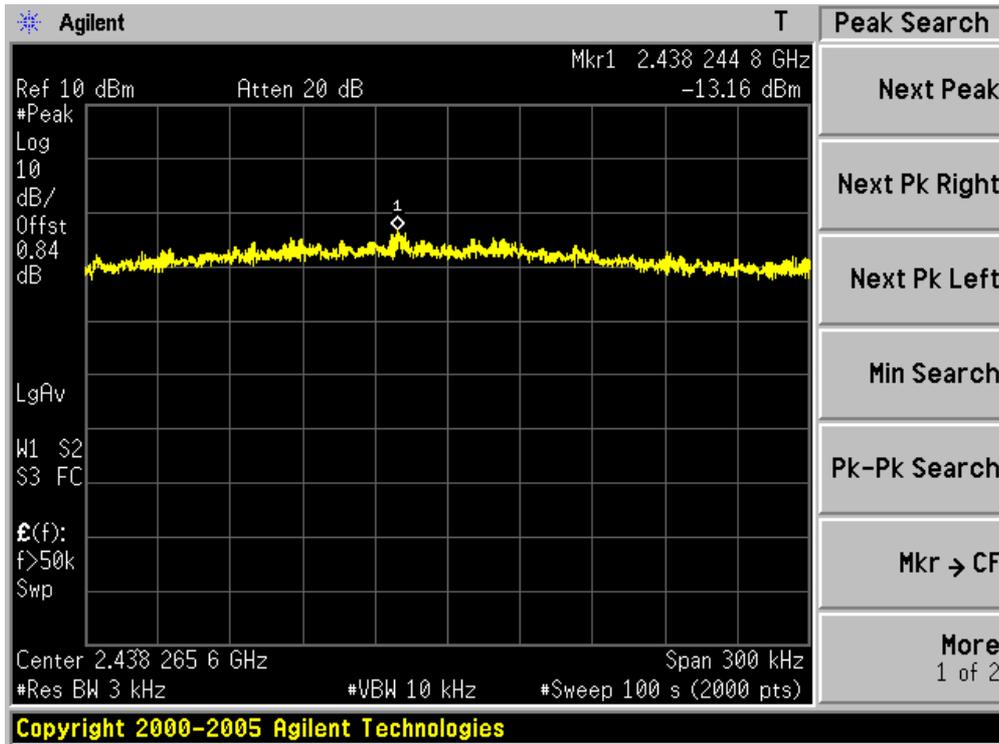
Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Spectral Density
Test Site	:	AC-6
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-13.16	8	Pass
06	2437	-13.16	8	Pass
11	2462	-12.96	8	Pass

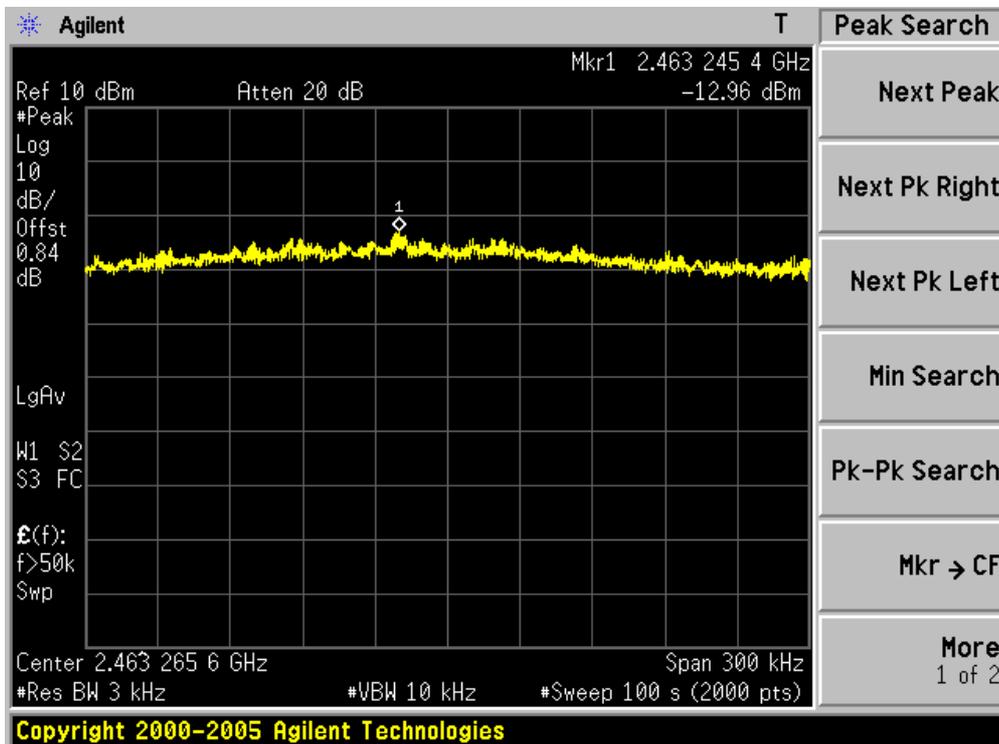
**Channel 01 (2412MHz)**



Channel 06 (2437MHz)



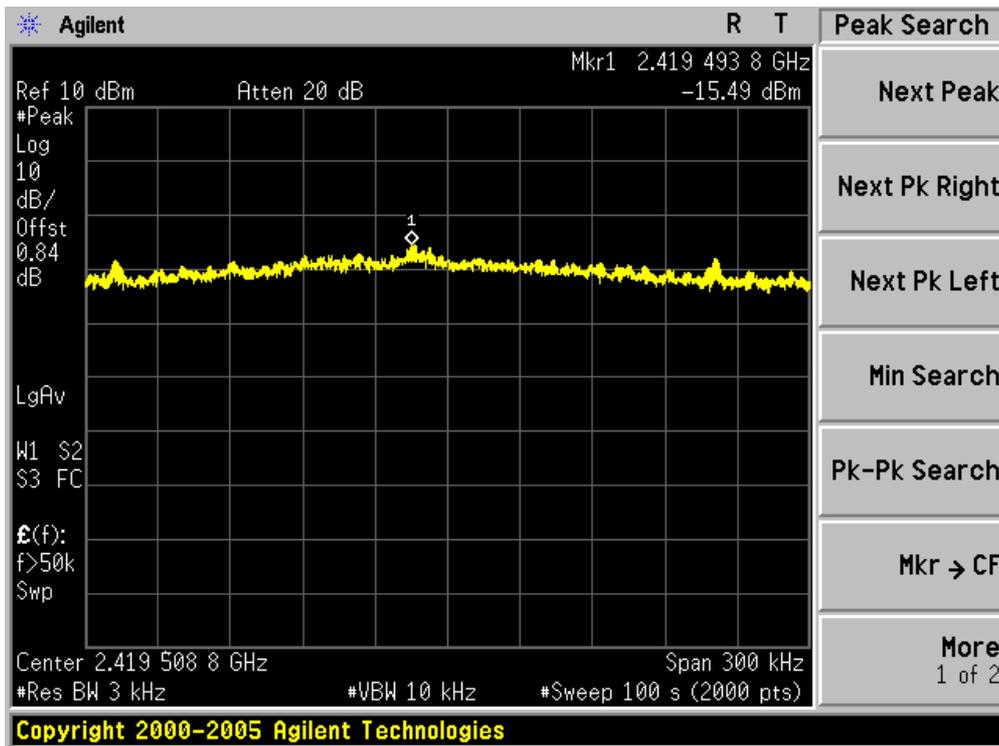
Channel 11 (2462MHz)



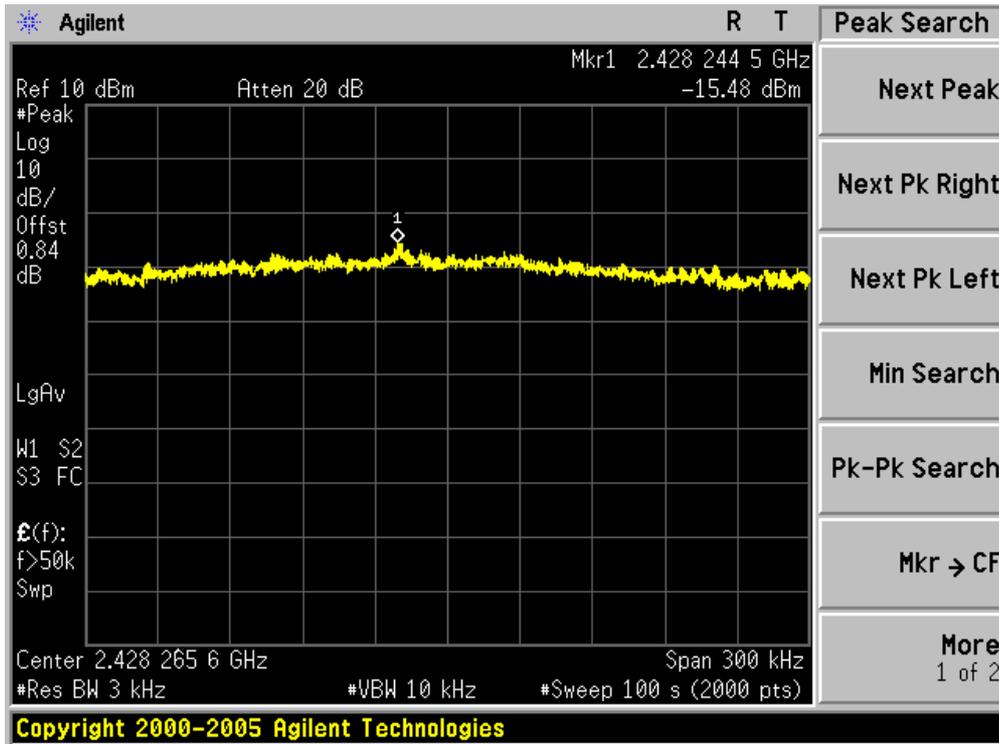
Product	:	HSPA/ Wi-Fi Module
Test Item	:	Power Spectral Density
Test Site	:	AC-6
Test Mode	:	Mode 4: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
03	2422	-15.49	8	Pass
06	2437	-15.48	8	Pass
09	2452	-15.64	8	Pass

### Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)

